THE UPPER CERVICAL
MONOGRAPH

Vol. 5, No. 8 | *Published by* THE NATIONAL UPPER CERVICAL CHIROPRACTIC RESEARCH ASSOCIATION | May, 1997

TABLE OF CONTENTS

POSITION PAPERS

Chiropractic's Most Thorough Training Program
Marshall Dickholtz, Jr., D.C.

IMAGES OF MASTERY
Lee G. Yardley, D.C.

X-RAY ANALYSIS

Understanding and Visualizing Atlas Transverse Contact
Steven M. MacDonald, D.C.

Letter to the Editor
Marshall Dickholtz, Sr., D.C.

ADJUSTING

The Triceps Pull and Adjustment
Steven M. MacDonald, D.C.

Working with the Digital Inclinometer
Marshall Dickholtz, Jr., D.C.

RESEARCH

A Review of "Comparisons of Lordotic Cervical Spine Curvatures to a Theoretical Ideal Model of the Static Sagittal Cervical Spine," an article by Donald D. Harrison, T.J. Janik, S.J. Troyanovich, and B. Holland *Spine,* Vol. 21, No. 6, March 15, 1996.
James Palmer, Professor, The University of Toledo

NUCCA NEWS

©NUCCA, 1997. All Rights Reserved.

Publication Committee:

Keith E. Denton, D.C.
Editor

Michael Thomas, D.C.
Assistant Editor

Editorial Consultants

Albert Berti, D.C.
Lloyd Pond, D.C.
Marshall Dickholtz, Sr., D.C.
Lonnie Pond, D.C.
Teresa A. Palmer, D.C.
Edward Stein, D.C.
Daniel Seemann, Ph.D.
James F. Palmer, M.S.

Chiropractic's Most Thorough Training Program

by Marshall Dickholtz, Jr., D.C

When the NUCCA Certification was first initiated in 1985 its purpose was to qualify doctors in the NUCCA work. Doctors who wished to be NUCCA Certified had to meet strict criteria for the purpose of either being eligible to conduct and teach basic classes or to just prove at least to themselves a level of practice excellence.

In the 10 years since the start of the program, 15 doctors have successfully completed their certification. Dozens of other doctors started but dropped out of the program at various levels. Some doctors dropped out of certification for reasons that varied from thoughts of being unfairly evaluated to having insufficient motivation to follow through to the next level.

When the certification program was initiated it was a great idea but the problem is that most doctors' participation or motivation in the program has been based on their own egos. When it comes down to consistently reducing the most demanding biomechanical and neurological problem of the human body, a doctor needs much more than his own ego to fall back upon.

The NUCCA doctors may be the most critically precise individuals within the profession. This may be why we are initially attracted to a system that is based in exacting measurement and reevaluation. It is understandable why so many doctors have decided not to pursue the completion of the program. With the cervical region's unrelenting demands for excellence, sometimes it is difficult for a doctor to be fully satisfied in reviewing his own post x-rays let alone sending them off for another's critical review.

First it is important to realize that the criteria used in the program is not criteria established by Dr. Gregory or the NUCCA Board but rather the criteria demanded by the body itself to have normal balance and neurologic function. Any proportionate reduction of the subluxation is a positive result for the patient; the more complete the reduction the better. Patients in their quest for better health deserve the best correction possible to maximize their own inner potential for health. The level of excellence demanded by the certification program is no greater than what you would want for yourself.

When it appeared to me that the doctors producing the most consistent corrections were the doctors that completed the certification program it had me question what it was that made these doctors function so effectively. Was it their own standards or the standards of the certification program? I believe it was both. Any doctor that practices NUCCA has already declared that he/she is committed to chiropractic excellence relating to the reduction of the subluxation. The next question was how can the certification program help a doctor become more proficient at correcting subluxations?

I believe that the certification program is chiropractic's most effective training process. Students, regardless of their school, all seem to state that the education that they got at college prepared them for their boards and understanding physiology and pathology. Rarely, if ever, have I heard a student declare that they were given the best education and training in the reduction of the subluxation. This is where the certification process comes in. Every step of the certification program puts the doctor engaged in the process through a logical progression of steps that builds all of their specific abilities in the art and science of reducing the subluxation. Written examinations demanding that the doctor learn structure identification, biomechanics, technique and the review of x-rays used in their own practices, building their knowledge in x-ray alignment, positioning, marking and finally consistently and maximally reducing subluxations, are all part of this progression.

For a doctor to persist in going through all the steps in the process of certification it is like being on a train set on the right track—it will get you where you want to go. The key is not getting off before you get there. Being in the certification process seems to go against a chiropractic college premise regarding technique "do what comes easiest to you". It is a demanding program because the C-1 subluxation requires us to perform at our best.

When each one of us went to chiropractic college it was to learn how to help sick people get well. The certification program allows us to further fulfill our dreams. Being certified is not the primary goal, learning and refining our skills throughout the certification process is the goal. Completing the certification is also not the end of one's training. Once a doctor becomes certified he/she is encouraged to coach or mentor other doctors making their way through the program. You learn so much through helping another and that feeds back into your own practice by continuing to hone the proper foundations in your technique. The answers provided through the certification program are purposeful and productive. There is always linear growth opposed to random facts without the necessary foundations to use them effectively.

I almost dropped out of the program because of my x-rays not passing during the third part. I thought the examining doctors were against me when they both returned my x-rays saying they were unacceptable. I was angry because they looked good to me. I had to resubmit another set illustrating all the criteria of the program. Needless to say that I was thrilled when that set passed. Earlier this year I had to re x-ray a patient due to an auto collision. When I looked at his old x-rays, it was a set that got rejected in my first attempt at part 3 certification. The note written on them by Dr. Pond that made me angry when they didn't pass said, "Come on, Marshall, you can do better than this". Looking at them now with eyes that have been trained throughout the certification program to recognize the qualities of readable x-rays, I was surprised that I could have ever submitted them for review. Only through the program and the generosity and integrity of the doctors that review certification did I acquire the knowledge to more easily recognize the essential foundations of quality care.

Being in the program does not require anything of you that is not already required within your practice. For which patient is it O.K. to have unaligned x-ray equipment, unreadable exposures, rotation on your films or low arches? Which patient responds well to unproportional corrections because of poor x-ray positioning, wrong technique or misunderstanding the biomechan-

ics? The criteria of the program is what makes a difference with your patients. Almost every professional has a coach that looks at what he/she is doing on the court and points to the skills that work and eliminates actions that are counter productive. Certification is effective coaching for chiropractors.

The program is continuing to be developed. Currently all the information a doctor needs is contained within the Monographs or text books. We hope to develop a certification work book that further breaks down specific steps as well as documents where to reference information. Volunteers to help forward this project are always appreciated.

One of Dr. Gregory's dreams was to have one hundred certified NUCCA doctors. Some day his dream will come true and even be exceeded when the true opportunity of this program is realized. Who doesn't want to be their best for themselves and their patients?

My invitation to you–if you are currently in the certification program stay on track. If you have dropped out look at what difference it could make within your practice (not with the easy cases, they always get well) but the challenging ones that leave both you and your patients feeling less than 100%. If you are a student or doctor and haven't started the program yet, I'll say this, the degree to which we are able to reduce the subluxation and remove brainstem tractionization or nerve interference is the degree that we are a doctor of chiropractic. Look forward to and use the dynamic structure of the program in helping you on your path to be your best.

Images of Mastery

by Lee G. Yardley, D.C.

EFFECTIVE ACTION

It has been said that there are three ways of acting effectively:

The first is by experience - this is the bitterest,

The second is by imitation - this is the easiest,

The third is by meditation - this is the wisest.

Based on this it would seem that the third action, that of meditation, would be the approach of choice. It seems that when embarking on a journey, such as we do when we make that decision to make NUCCA a part of our professional practices, we are going to find it necessary to utilize a combination of all three approaches.

Which of these three approaches will primarily be used will vary depending on our personalities, where we are in our development, and resources that are available to us given the task at hand. I personally have tended towards the second choice whenever the opportunity has availed itself seeing no virtue in reinventing the wheel and finding ample opportunity for utilization of the third method on a day-to-day basis in my practice and all too often having to revert to the first only as a last resort (not being particularly masochistic in nature.)

"OUR STRENGTH IS OUR WEAKNESS"

While visiting Dr. Berti in his office one day I took the opportunity as I usually do to pick his brain on one particular topic or another. (I haven't yet determined whether he finds this amusing or an annoyance but he patiently answers my questions anyway.) This particular day I was expressing my concerns that it was my feeling that children of any age should be given the opportunity of being subluxation free and inquired how he approached the challenges of providing NUCCA care to young children? To this he gave me an answer that was to become a resounding theme "... Our strength is our weakness..." in other words one of our greatest strengths as NUCCA practitioners is that with our pre and post X-rays we are capable of achieving 80-100% corrections. Just as importantly we know when we have not reached that goal and develop a strategy to further improve the correction. This enables the NUCCA practitioner to obtain results that are not otherwise obtainable. Yet the very tool that provides us with that technology can become our obstacle in caring for children. He continued giving me some valuable advice on X-raying and caring for babies and children which he presented at the end of a seminar several years ago.

POST X-RAYS

One of our strengths, post x-rays, can be our greatest frustration. In my first few months of practice as a NUCCA practitioner I pre and posted my first NUCCA patients not expecting 100% corrections quite yet but knowing that they would quickly follow. It was to my utter horror that my patients' subluxations were looking significantly better on the pre's than the posts. I was seriously wondering who should be paying who. Alarmed I called Dr. Berti asking how could he let me loose on patients? He answered that if I had bothered to post my patients in my many years of practice that I was in fact doing no worse to them than before, the difference was that now I knew. This seemed little consolation. Not knowing, I at least was able to sleep at night. With time, persistence and effort my post x-rays allowed me to know when I could send a patient home, when they would do well and when it was necessary to continue to work on a case. It provided me with the tools to know how to troubleshoot my problem cases. Yes, there have been many times that I would have preferred to have simply sent a case home after their first adjustment but my post X-ray and integrity would not allow me to do so. While this has at times led to high levels of frustration it has also led to a better correction for my patient, higher skill levels for myself and better corrections the first time for future patients.

VALUE OF SEMINARS

In the seminars we have the opportunity to learn by imitation. This is particularly true in such things as adjusting, x-ray positioning, etc. In our offices when we take our pre x-rays and analyze them and study the biomechanics, we are acting on meditation or thought. As we study our posts we then act based on our

experience. It would seem that the more we can learn by imitation from those who have walked the path ahead of us the more we can conserve our alternate resources and reduce although not eliminate the need to learn by experience.

BASICS AND COMMITMENT

In studying any evolved art or skill a common underlying principle that repeatedly emerges is that mastery rests in developing a high level of ability in the basics. As beginners, we cannot wait until we have mastered the basics so that we can get to the really good stuff. Often we fail to realize that the really good stuff comes about as a result of getting good at the basics and only as a result of getting good at the basics. A second principle is that the more time you spend developing a skill and studying an art form the more quickly you will learn it. This is true of any art. In ballroom dancing you improve based on how many lessons you take and what is known as floortime. In martial arts it is mat time that determines how fast you advance. So it is in NUCCA. Spend 1/3 or 1/2 of your practice time on NUCCA and this will affect your rate of progress and ultimately your level of proficiency. (There is certainly no shame in this. To do so and not realize the above will only lead to frustration.) It is also important to realize that the people that achieve the highest levels of accomplishment in any human endeavor, without exception, have always been individuals who choose to commit themselves 100% to their work. It is also something to note that the higher levels of most endeavors are only available to those who are willing to make this kind of commitment.

TALENT

During the 8 yrs that I spent as a student of Aikido there were three of us that entered the Dojo who were also Chiropractors. Of the three of us one was particularly talented. In fact, compared to the vast majority of students that entered the Dojo this gentleman was a very fast learner. He advanced further in three months than I did in my entire first year. Of the three of us, the two of us that were to achieve black belt level had to work harder, were obviously less talented and had far more obstacles to overcome.

As an instructor in Aikido and also in training Associates over the years it has been my observation that it is rarely the talented ones who reach the high levels of success. Those that have to struggle and work each step of the way are the ones that make it to the top. I think that there is a great deal of truth in the saying "It is not your aptitude but your attitude that determines the altitude to which you will aspire." As we talk to the top teachers that we have in NUCCA today none of them claim talent or brilliance; they will all share the trials and difficulties they had in mastering this work. It would be my guess that they could tell stories of individuals that entered this work who were both bright and talented but who have long since moved onto "better" things.

TEACHING PROFESSIONALS vs PROFESSIONAL TEACHERS

One of the strengths that we have is that our teachers in NUCCA spend each day of their professional lives performing and improving the very things that they are teaching us. Their livelihood depends on the effectiveness of what they are giving us. The advantage to us is that they can teach on a level that only a clinician can teach another clinician. They also have absolutely no reason to add, embellish or alter things so you will come to another seminar. They are paid nothing to teach the seminar and would in fact make far more money if they stayed in their practices. The down side to this is that the presentations may not be as polished as if you had professional teachers, although I think they do very well. They are less inclined to allow themselves to be engaged in intellectual gymnastics for the sake of the sport. They will bend over backwards to be of assistance to a Doctor who treats them with respect and who has a high degree of commitment to the work. It is understandable that they are probably more inclined to help a doctor who has committed his/her entire livelihood to the success of this work than those who are simply curious or wish to add this to a growing list of techniques.

For more of the same reasons the teaching doctors may be less diplomatic in their dealings with a doctor who is arrogant or challenging in his/her questioning. This would be especially true if the doctor is new or has not been attending seminars and is not making an attempt to question the work from a position of understanding and respect for the 30-40 yrs the instructor has dedicated to the work.

PUSHING THE ENVELOPE

At a recent program Dr. Lloyd Pond presented some approaches to adjusting more difficult subluxations that were deviations from the more standard approaches. I considered myself privileged to be exposed to his presentation together with a group of NUCCA doctors. Initially the approach seemed to violate the very basics of adjusting he taught in the seminar. I had to remind myself that here was a doctor that had done this work, not for one year forty times over but for forty years, our top technique teacher. He was functioning at a level that many of us could only hope to one day reach. I remember seeing footage of O'Sensei the originator of Aikido at the age of 80 yrs instantly repelling 6 attackers and even as an advanced student, knowing the techniques, watching in amazement. It seems at times we need to give ourselves the time and space to allow ourselves to grow into the understanding, listen to what the masters tell us.

Understanding and Visualizing Atlas Transverse Contact

by Steven M. MacDonald, D.C.

The NUCCA procedure for doctors is predicated on the precise and scientific analysis of the cervical spine and skull and how it influences the balance and health of the body. This scientific understanding is critical for the doctor to properly correct the Atlas Vertebral Subluxation Complex (ASC). NUCCA continually teaches doctors to understand the sophisticated biomechanics involved in the cervical spine.

This article is written for the purpose of properly understanding and visualizing the surrounding anatomy of the atlas vertebral transverse process (Atlas TP). This information is necessary if the doctor is to properly contact and correct the ASC. Articles have been written that teach the use of artifacts on the earlobe to stand out on x-ray to help the doctor in contacting the atlas TP. It is this writer's belief that the doctor first needs a precise understanding of the related anatomy for proper visualization. Any use of artifacts on the x-ray film cannot replace correct knowledge of this region of the spine. Distortion of anatomical structures on x-ray is given as the reason for relying on artifacts, but it is my belief that distortion is not as great a problem as it is conjectured to be. It appears that when one relies on the use of artifacts for location of atlas TP, the practitioner will not properly visualize the surrounding area. I feel the doctor needs to be familiar with the surrounding anatomy to be able to apply the proper contact for the atlas TP.

The proper procedure for identification of the atlas TP is to relate all three radiographs used for analysis of the ASC. Each radiograph is important for correct structure identification. The doctor needs to stand back and look at the radiographs and visualize how the atlas structurally relates to the occiput bone, temporal bone, mandible and axis vertebra.

The doctor should first identify structures on the Nasium radiograph, in order to identify the structures on the Lateral radiograph. The structures to be properly identified are the inferior mastoid process, occipital condyles and atlas TP on the side of laterality. These structures must be properly related to each other for correct relationship on the lateral film. The inferior mastoid process is visualized in relation to the inferior occipital condyles. It is important to note whether the inferior mastoid is superior, at the same level or inferior to the occipital condyles. This information is then taken to the lateral film for proper location of the mastoid process.

The lateral radiograph is next analyzed for structure identification. Doctors should be well acquainted with the anatomical architecture of the temporal bone[1], how it forms the mastoid process, how it helps form the external auditory meatus and the mandibular fossa for proper articulation of the mandible bone (fig. 1). It is important to know how C-1 articulates with the occipital condyles and how the atlas TP is anatomically located in relation to the mastoid process, the external auditory meatus, the mandible, the occipital condyles and the lateral mass of the atlas. This knowledge of the related structures is most important if one is to properly correct the ASC.

To secure the correct location of the atlas TP, measurements are first made on the Nasium radiograph on the side of atlas laterality. A horizontal line (line A) is drawn across the film connecting the inferior apexes of the mastoid processes of the skull. A line (line B) is also drawn horizontally across the film connecting the inferior medial apexes of the occipital condyles of the skull. Another horizontal line (line C) is also drawn across the film on the superior atlas transverse process tubercle on the side of laterality. Two measurements are made at this time; the first between line A and line B for the distance between the mastoid process and the occipital condyle on the side of atlas laterality. The second measurement is made between line B and line C for the distance between the occipital condyle and the superior atlas transverse process on the side of atlas laterality. In the majority of cases the superior border of the transverse tubercle is on the same plane as the inferior occipital condyles. This measurement is then transferred to the Lateral film for the correct distance and relationship between the mastoid process, occipital condyle and atlas transverse process. I believe distortion is minimal on the Nasium film because of the close proximity of the structures to the x-ray film. Accurate measurements can be made on this film. See fig. 2.

On the Lateral film it is important to draw the outline of the mastoid process, its anterior-superior border and outline its formation of the external auditory meatus. This is important for correct measurement and relationship of its location to the atlas TP. Structures are larger on the Lateral film due to their greater distance from the x-ray film thus creating increased distortion. Correct measurements can be taken from the Nasium film, but must be adapted from the Vertex film. See fig. 3.

Continuing on the Lateral film, once the mastoid process and external auditory meatus have been outlined, outline the occipital condyle. The distance between the occipital condyle and the mastoid process is the measurement between line A and line B. The distance between the occipital condyle and the atlas TP is the distance between lines B and C. The atlas TP is most often found in the center of the lateral mass of the atlas on the lateral film and at the level of the occipital condyle. To correctly find its A-P location, measure on the Vertex film its distance posterior to the atlas anterior tubercle. On the Vertex film structures are close to the film where the distortion is minimal. Berti[2] noted on the Vertex film the atlas vertebra is four and one-half inches from the film and on the lateral film it is eight and one-half inches from the film, causing three-sixteenths of an inch of distortion in the A-P length of the atlas vertebra. This correction is subtracted in our calculation. On the Vertex film draw a horizontal line at the anterior border of the anterior atlas tubercle (line D) and horizontal lines at the anterior border of the atlas TP (line E) and the posterior border of the atlas TP (line F). See fig. 4. Measure the distance between lines D and E for the distance of the atlas TP from the anterior tubercle. Transfer this measurement to the Lateral film for correct distance of the atlas TP from the anterior tubercle. Subtract three-sixteenths of an inch for distortion. Also measure the A-P distance of the atlas TP on the Vertex

film (line E and F) for correct A-P distance of the transverse tubercle. The superior-inferior size of the atlas TP can be measured from the Nasium film.

These measurements will help the doctor to more accurately measure the correct location of the atlas TP for proper contact. The doctor should take his/her time in these measurements and reason that these measurements make sense. Knowledge of the anatomical structures are the basis of specific and correct adjustments.

References:

1. Gray's Anatomy, 35th British edition, Philadelphia, W.B. Sanders Co., 1973.

2. Berti, A. "Identifying and Locating the Transverse Process of C1," Upper Cerv. Mono., Aug., 1990, 4(10), 1-2.

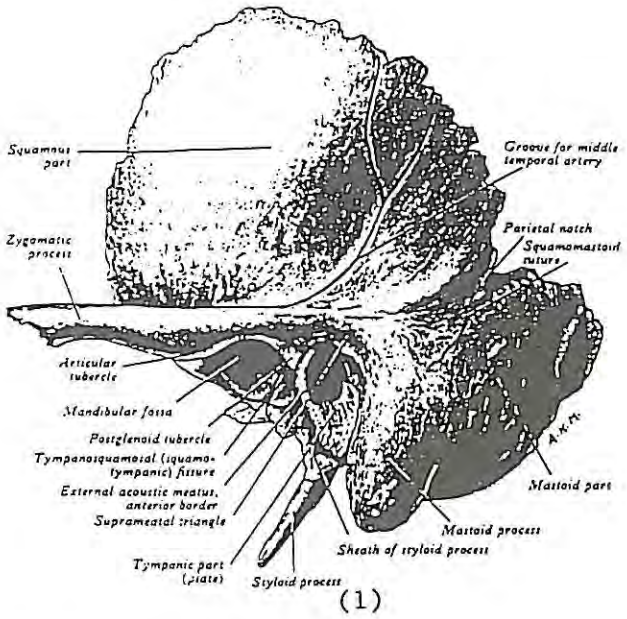


Fig. 1 The left temporal bone. External aspect.

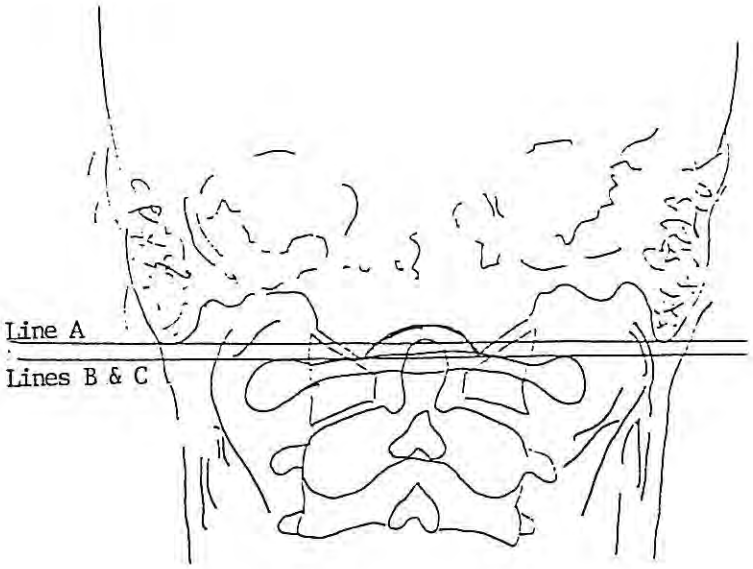


Fig. 2 Nasium view displaying relationship of mastoid processes, occipital condyles and atlas transverse processes. Lines A-C.

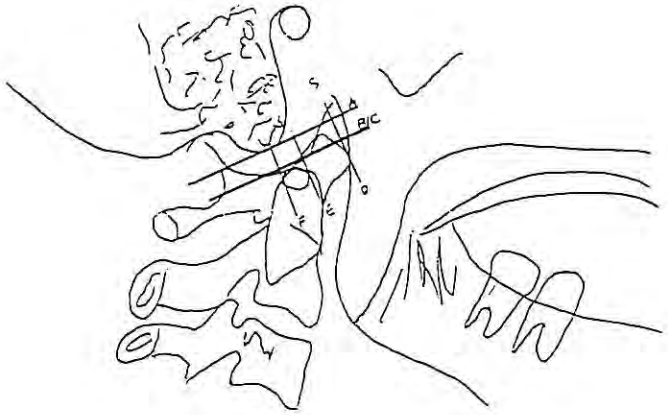


Fig. 3 Lateral view displaying Lines A-F transferred from nasium and vertex views to correctly locate atlas transverse process.

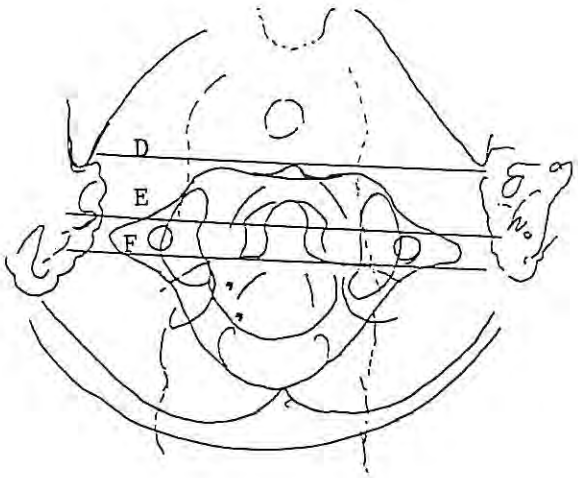


Fig. 4 Vertex view displaying Lines D-F for anterior to posterior measurement of atlas transverse process.

A Letter to the Editor

by Marshall Dickholtz, Sr., D.C

A letter to the Editor of the Monograph regarding Dr. R. G. Cockwill's article in the May, 1996, Monograph Vol. 5, No. 7. In this article Dr. Cockwill asserts that there is free movement between C-0 and C-1 in the frontal plane in a range between 1.15 to 2.95 degrees. I strongly disagree with his hypothesis, and others who may be working with cadavers where there is no muscle tonicity. I have been working with the atlas subluxation complex syndrome for forty years. In this time I have seen approximately 20,000 patients, and analyzed approximately 90,000 nasal x-rays. I have concluded that the atlas is locked in its normal position or its subluxated state in reference to its laterality. Normal position may, at most, include 1/2 of a degree of movement toward the side of laterality when there is a subluxation present.

In the appendix at the end of this rebuttal you will find itemized the research and articles I have published in the Monographs and Chiropractic Economics over the past years that are pertinent for taking and analyzing the sharpest cervical x-rays possible.

To begin my rebuttal, if there was free movement as Dr. Cockwill states, this surely would have been detected over the last 50 years by NUCCA doctors when the post x-rays were taken. Dr. R. Gregory stated that, "There is no such thing as structural distortion or misalignment of the normal pelvic girdle in the absence of upper cervical subluxation. Neither can there be a short leg, except in those cases where deformity exists, in the absence of an atlas vertebral subluxation."[11] Gregory also stated, "The atlas subluxation syndrome is defined as those signs which are always present and measurable in proportion to the intensity of the Atlas Subluxation Complex: misalignment factors as shown by x-ray, resulting traction of the neurological component, presence of spastic contracture of the lumbar and pelvic girdle, displacement of the body's center of gravity, contractured leg, and deviation of the spinal segments from the vertical axis of the body."[12] A portion of an excerpt from a Gregory article states, "C-1 cannot misalign laterally more than 1/2 degree from its alignment to the occipital condyles (about the thickness of a sharp pencil mark). Without imbalancing the neurological inhibitory mechanism of the reticular formation at the caudal end of the brain stem, C-1 has practically no normal lateral range of motion. This phenomena has been observed and tested on over 10,000 cases over a period of many years. The C-1 distortion syndrome has always manifested itself whenever C-1 has moved laterally 3/4 of one degree or beyond on the occipital condyles when the vertebra was moving from its normal position toward the abnormal position."[20] Gregory states, "There are therefore, measurable means of determining a normal as well as an abnormal. These means are based upon x-ray measurements of the misalignment factors as disclosed by the x-ray film: upon measurement of the neurological detriment from the misalignment factors as reflected in body distortions, upon measurement of the existence of a normal."[13]

Again from Dr. Gregory: "The oldest and best test is the comparative (post) x-ray taken immediately following the first adjustment. The post x-ray is conclusive as to its findings. It not only verifies the correctiveness of the analysis, but indicates the degree of the skill of the adjustor."[18] One of the reasons I quote Gregory here is because in 1,000 of his cases, 1/3 of them were locked in a 3/4 to 1 degree laterality. (This percentage should hold true in all statistics). If there were free movement of the atlas, the body would not exhibit distortion.

Seemann[14] states that when the subluxation was reduced to zero in all planes, the anatometer[16] also recorded zero in both planes. This was a reference to x-rays and it had to include small lateralities. The anatometer is a device for measuring the distortion stress effects of a C-1 subluxation on the human body. In the presence of a C-1 subluxation, the pelvic girdle shifts laterally into the transverse plane. The spine deviates from the vertical axis (normal position) of the body. These distortions are indicative of a C-1 subluxation and are remedied when the C-1 subluxation is corrected. In a research study in November 1978[15] four NUCCA chiropractors reduced laterality in 355 cases and the pelvis reduced in the frontal plane. In no case did the pelvis increase in the frontal plane. This was determined with the use of the anatometer. Again I want to emphasize that 1/3 of the subluxations (atlas) are only 3/4 to 1 degree off of the central skull line.

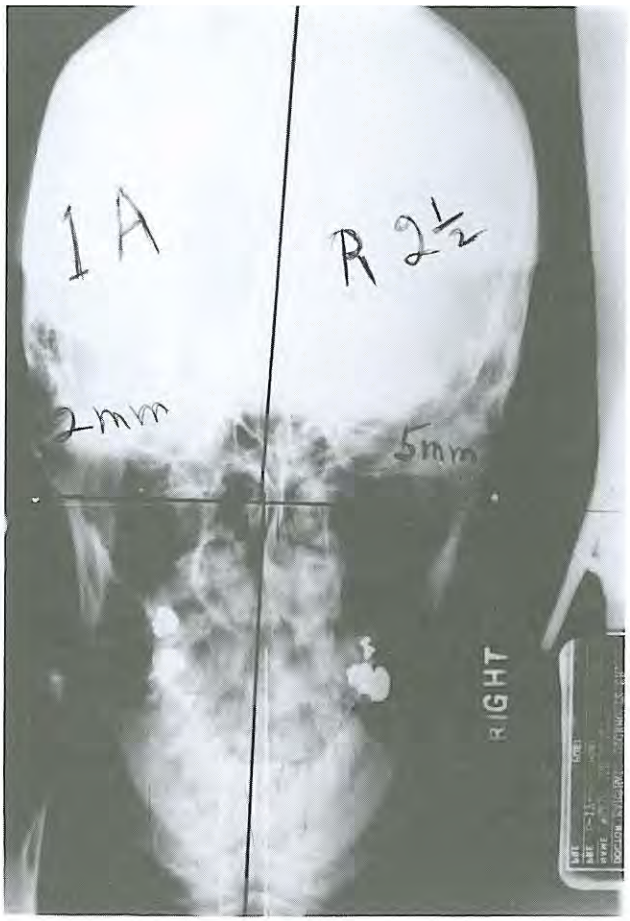
At this time I want to state the importance of needing the sharpest x-rays possible to pinpoint where the inferior border of the posterior arch crosses the lateral masses. When a line is drawn through these points it has to bisect the exact center of these points. Were this line to go above one point and below the other, the measurement of the patient's laterality could change from a right to left or a left to right. On some nasal x-rays these exact points are very hard to find. X-ray techniques have to be changed in this event.

Now to Dr. Cockwill's article again... To my knowledge no NUCCA certified chiropractors were used in Dr. Cockwill's project. Aligned x-ray equipment does not produce high quality x-rays by itself. In regards to his section on Authors' Comments he states that perfect films were not obtained in all cases. He even mentioned a low posterior arch. He and other chiropractors in this study did not understand that the biggest error in upper cervical work is trying to use a film that has a low posterior arch. This does not speak well for their research, as Dr. Cockwill said they were experienced chiropractors. The second biggest error that they had was using x-ray film with head rotation. This is essential when trying to prove or disprove lateral motion between C-0 and C-1. This disallows Dr. Cockwill's idea of 3mm. head rotation being acceptable. The assumption that the central x-ray beam was centered to the atlas when the head clamp was on the parietal region cannot be accepted. This in itself could produce error. He did not mention the angle of the central cephaloscope line in relationship to a vertical center line. If the films he compared didn't have the same angle, there would be another compounding error. If he has a vertical center line on his film from a lead painted line on his bucky, he should have mentioned the atlas distance from it on each film. This could be done by observing the center of the odontoid, which in most instances

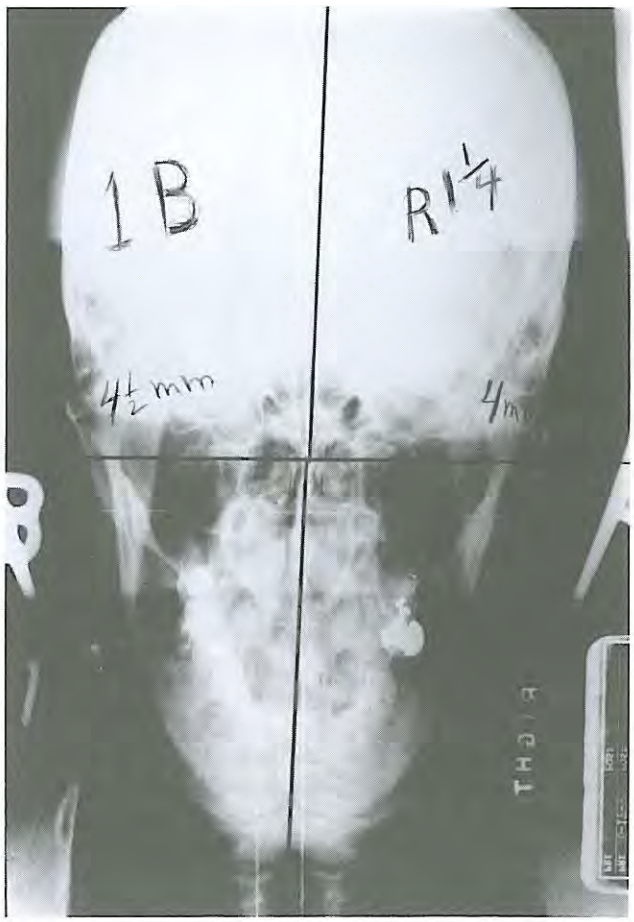
would be centered in the atlas. This would also prevent miscalculations. The suggestion that the head clamp position over the tip of the mastoid prevents free movement of the atlas of one mm or more is erroneous. There are approximately 25mm of soft tissue over the atlas transverses. With any stress placed on this area by angular rotation of the lower cervicals, the atlas would move lateral if it was not locked in its position.

Using a digitizer to read poorly obtained x-rays is not at all scientific. Again, you cannot read a film with a low posterior arch. If chiropractors take two nasal x-rays, one with a slightly higher S-line projection then the other and if the posterior arch is good on both, they should be able to analyze them both within one quarter of a degree. When 3/4 of a degree laterality has been the criteria for fifty years, it has been stated that the proof of the scientific accuracy of the system stands or falls, line drawing and all on the prediction of the outcome of the analysis and the adjustment.[19] If there was all the free movement that Dr. Cockwill states, this system would have been discarded a long time ago. If there was any free movement, at least one-sixth of the post x-rays had the possibility of showing a right listing from a left listing or visa-versa.

Dr. Cockwill also states there is as much as 45 degrees of rotation of atlas on axis without noticeable neurological insult. All he has to do is to put a patient that is subluxated in a supine position and have them turn their head to see a shift in leg lengths. When the head is turned in the direction that increases the leg length disparity and kept that way for awhile, there would be a greater manifestation of neurological involvement. When trying to prove free movement between C-0 and C-1, there has to be identical films in all aspects. Nothing else can be acceptable. Dr. James E. McAlpine and I had answers to Dr. Cockwill's last article in the November 1994 Monograph.[20] The following sets of x-ray films will demonstrate the importance of using films that are perfect in all aspects if comparisons are to be made.



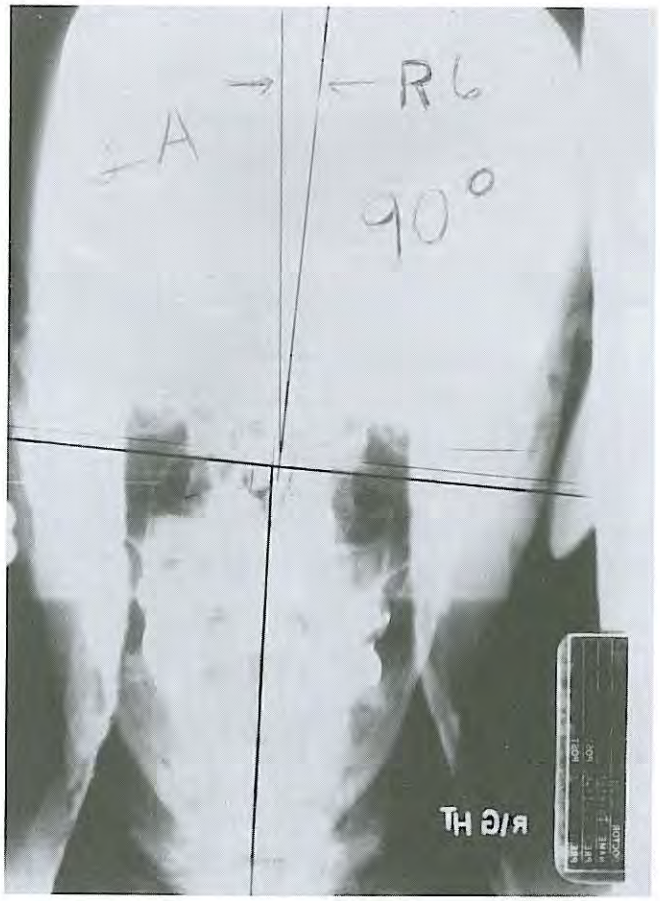
Film 1 A



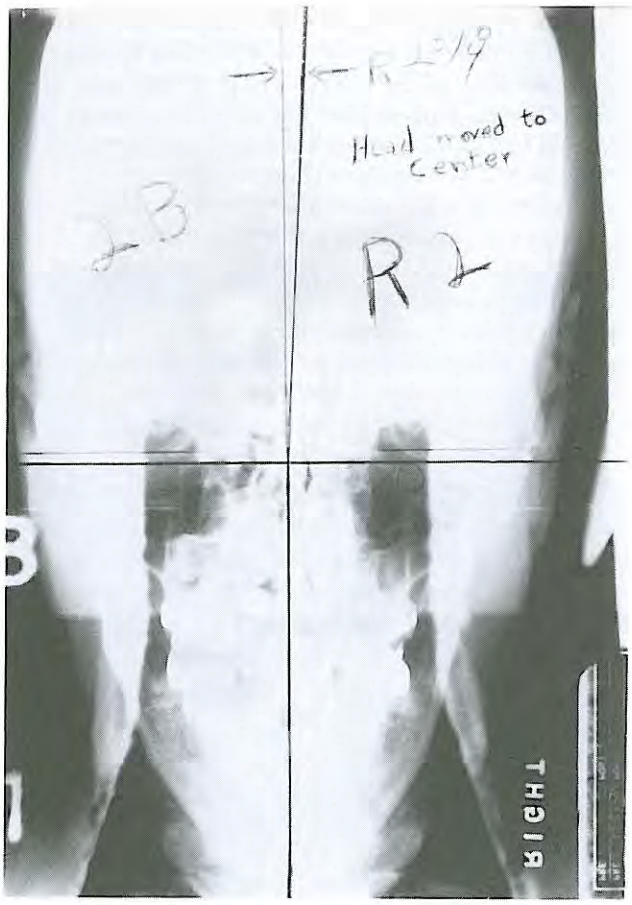
Film 1 B

Film set 1 (Rotation): Shows the change in laterality when head rotation is present and when it is removed. Film 1A with the head rotated measured right 2 and 1/2 degrees of atlas laterality. The distances between the mastoids and zygomatic arches are apparent on both films. On the rotated film the spaces are 2mm on the left side, 5mm on the right side.

After the rotation was taken out (10 minutes later) laterality was 1 and 1/4 degrees. These are both pre-adjustment films. The zygomatic mastoid space on the film 1B measured 4 and 1/2 mm on the left side and 4mm on the right side. Taking a twist out of the head of 2mm in these spaces, changed the laterality 1 and 1/4 degrees. The odontoid process is in the center of the x-ray films. This is made clear by the vertical line that was imprinted on the films from lead paint imbedded in the grid carrier that is in the center of the x-ray field. The zygomatic arch should not be used as the only criteria to see if there is head rotation on a nasal film.

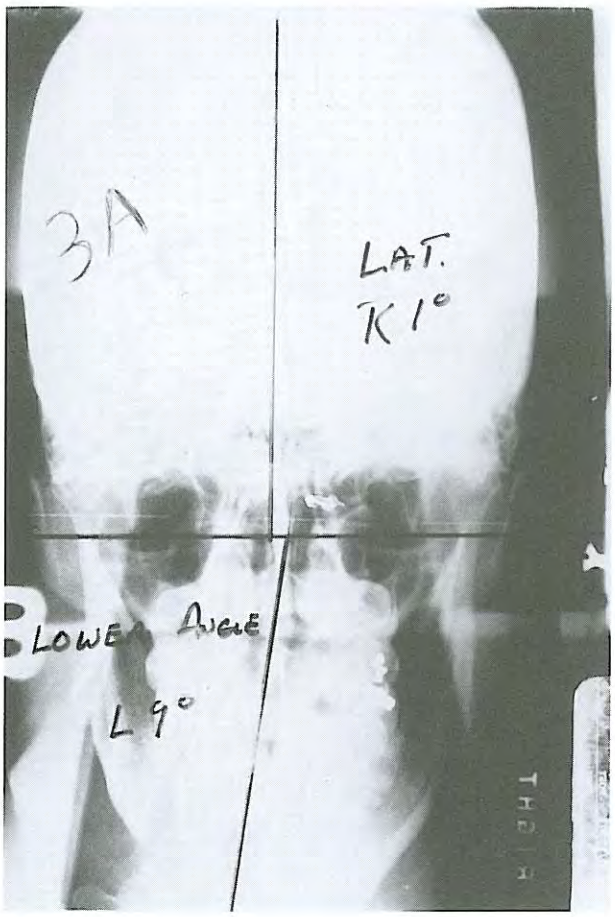


Film 2A

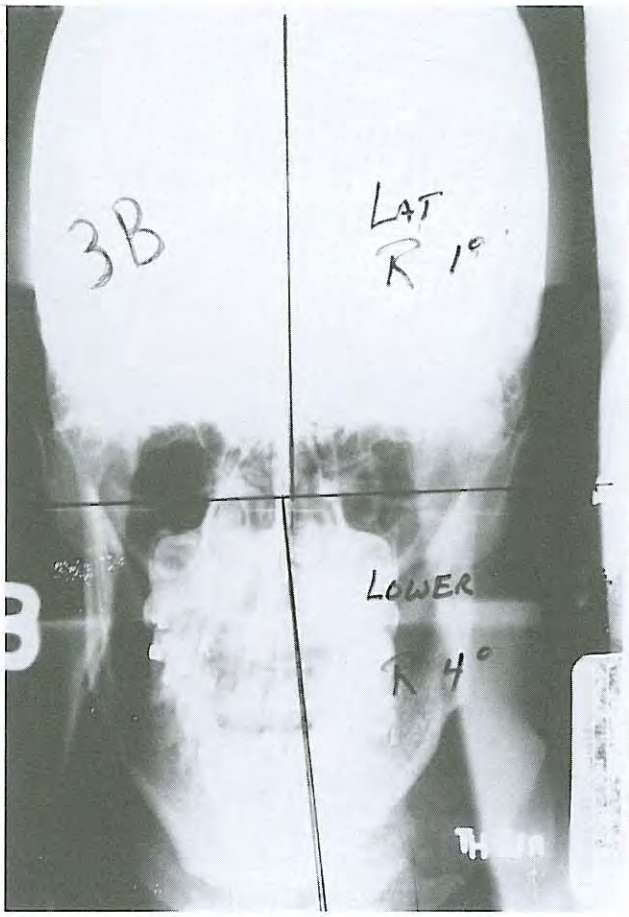


Film 2B

Film set 2 (Head Tilt): Film 2A shows an atlas laterality of 0 degrees, but the spine and pelvis are not balanced. The head is leaning six degrees to the right of the vertical axis. The patient's head was then moved to a straighter position only 2 and 3/4 degrees right of the vertical axis. The more true laterality was measured at right 2 degrees. Again, the odontoid is in the center on both films.

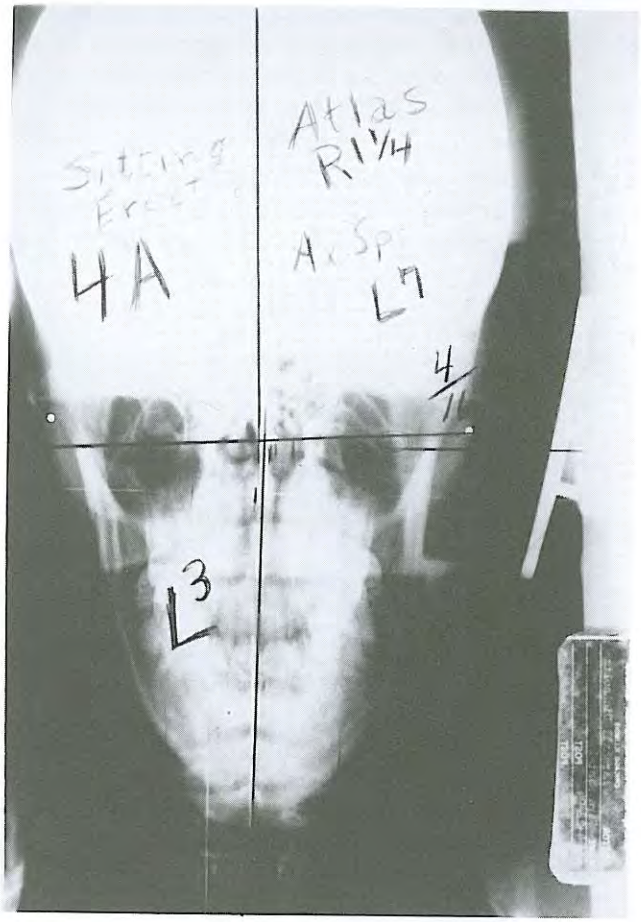


Film 3A

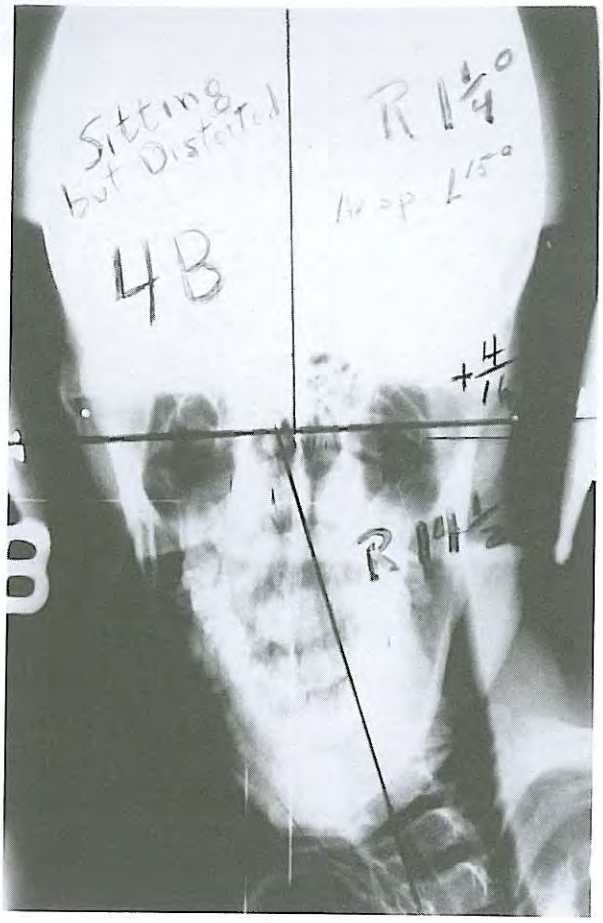


Film 3B

Film set 3 (Forces Lower Angle): Again, two nasal films were taken within a few minutes of each other. This patient was sitting in the x-ray chair that was off center in both directions. His head was brought to center; the lower angles changed with no change in atlas laterality. The lower angle was changed from a left 9 degrees in film 3A to a right 4 degrees in film 3B. If there was any free movement between C-0 and C-1 the laterality should have changed. The odontoid differed only 2mm from the center line and the center of the x-ray beam.



Film 4A



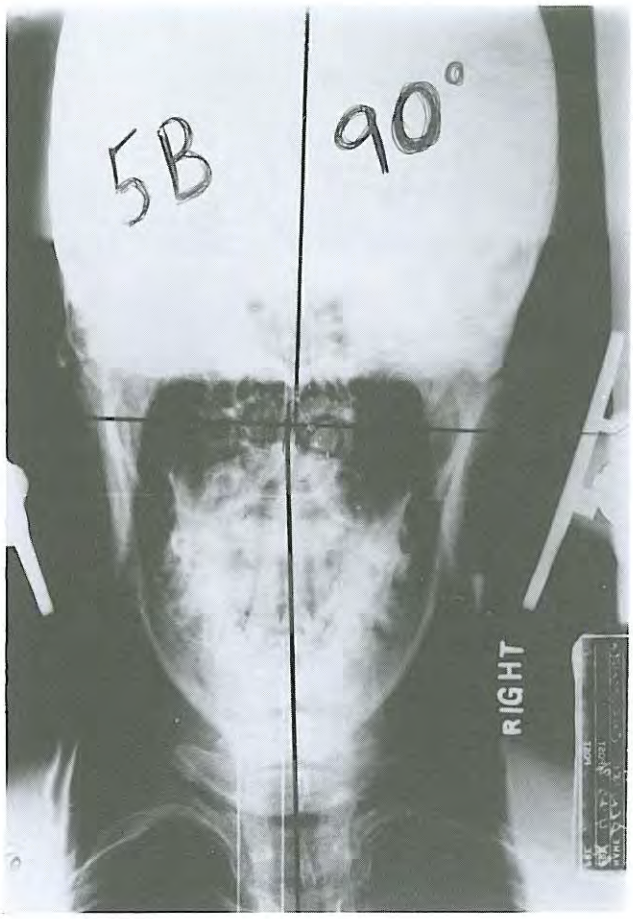
Film 4B

Film Set 4 (Forced Increase of Lower Angle): Here I have a patient in a neutral position that has a right listing 1 and 1/4 degrees. Film 4A has a lower angle of left 3 degrees. The chair was moved off to one side and the patient exerted as much bend as possible while the film was taken. The lower angle was then measured 14 and 1/2 degrees to the right. The upper angle was still right 1 and 1/4 degrees.

These two films can be superimposed by using the metal markers near the mastoids, and the central skull line and plane line can be compared. The atlas is still locked in its subluxated state.



Film 5A



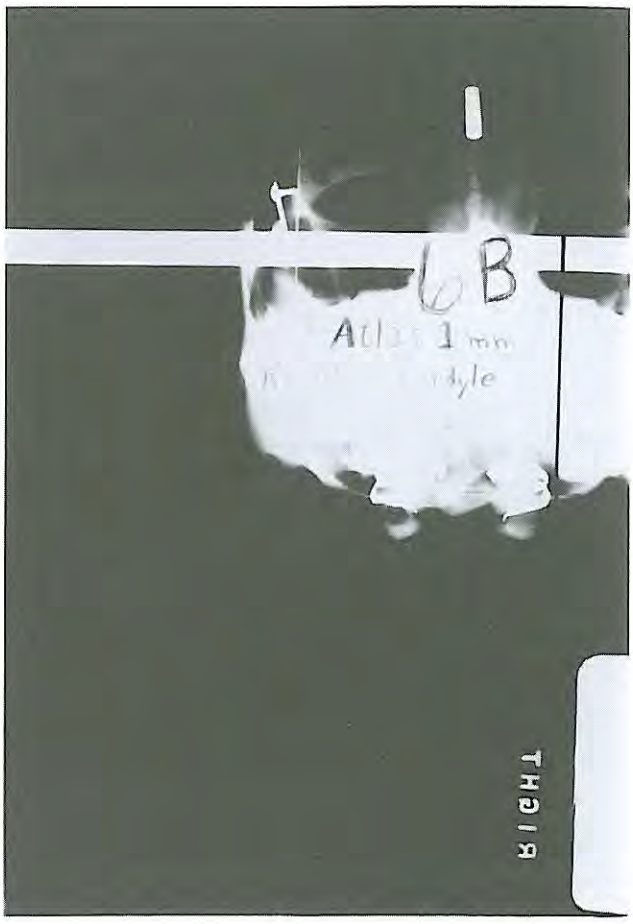
Film 5B

Film Set 5 (Rotated Head): This is an astonishing set of post films. They were taken 10 minutes apart (no adjustment given). They prove that even with a slight twist of the head, laterality can change radically. If these films are superimposed with the edges of the films, there is only one degree difference in the central skull line. The odontoid on film 5A is 4mm right of the center line. The odontoid on film 5B is 1mm left of the central line.

The rotation of the head off center can be viewed by looking at edges of the parietal regions and the nasal shadow as it crosses the atlas. With the rotated head in film 5A, laterality measures right 4 and 1/2 degrees. The symmetrical head in film 5B measures 0 degrees laterality. If there is no head rotation and if the odontoids are not in the same position in the x-ray field, there is unequal distortion of all parts of the atlas, including the posterior arch attachments.



Film 6A



Film 6B

Film Set 6 (Radiation Distortion): I made a plastic skull with a 3/8 inch rod going through it. The rod is placed level between head clamps and each end is an equal distance from the front of the grid carrier. Lead strips outline the condyles and the lateral masses. The atlas was glued to the condyles. The head was moved to the left and then the right with films taken of each position.

On measuring the edge of the leaded joints from a right angle line drawn from the metal rod, I found that on film 6A the edge of the atlas was 1mm left of the edge of the condyle. On film 6B the edge of the atlas was 1mm right of the edge of the condyle. The interpretation here is very obvious. Objects magnify differently when off the center of the central x-ray beam even when they have such close proximity as the condyles and lateral masses of the atlas. Let me emphasize that when trying to compare two x-rays they have to be exact copies. The errors described in this article have to be eliminated. These include:

1. The inferior boarder of the posterior arch has to be pinpointed as it crosses the lateral masses of the atlas.
2. The angle of the posterior arch can't be too high or too low and you should be able to see the posterior arch attachments to the transverse processes.
3. There should not be any rotation of the patient's head on the film.
4. The cephalocentroscope line should have the same angle to the vertical center line.
5. The odontoid of both films should be identical as to their distance to the center line. If the atlas is not on center, the central beam is not giving you equal or symmetrical magnification. In most cases the odontoid moves with the atlas.
6. With proper filters the parietal region should have a little white area around it. It will be analyzed with greater accuracy. X-ray equipment not only has to be aligned, but all stray radiation has to be eliminated to the fullest extent possible.

Trying to use a computer to analyze and compare mistaken x-rays, as the old saying goes is garbage in, garbage out. The conclusion is that the articles of Dr. R. Gregory and myself strongly disagree with Dr. Cockwill. There is not any free movement between the atlas and the condyles in the lateral plane. Only x-ray distortion of poorly obtained x-rays cause it to be interpreted as such.

This article and the following appendix help other chiropractors that are doing upper cervical work to understand the necessity of getting the proper x-ray film interpretation in order to arrive at the exact force vector in the adjustment.

Appendix

1. Magnification; How Much of a Problem in Spinographic Analysis.
2. Comments and Concerns re: X-ray Radiation.
3. Errors in Taking of Cervical X-rays and Their Effect on Analysis.
4. Optimizing Port Size for Cervical Films.
5. Locating the C-1 Transverse Process Using Surface Lead Markers.
6. A Method to Determine the True Head Tilt When Taking a Nasal X-ray.
7. Radiology—Better X-rays, Better Corrections.
8. Filters for Specific Upper Cervical X-rays.
9. Patient Alignment for Upper Cervical X-rays.
10. X-ray Equipment Alignment Booklet.

Included in the above is microline grid research for the sharpest x-rays with less radiation to the patient. The grid I use has 150 lines per inch with 40-50% less radiation absorption. I might also state that when x-ray equipment is aligned properly, you have equal magnification on both sides of the parietal region of the head only when the central skull line is in the vertical axis. My x-ray equipment was designed so that I use a .6mm focal spot on a 150 Ma station. This size has very little penumbra. The lead filters I designed, cut at least 50% of the radiation to the patient and produce less scatter radiation for sharper films.

References:

1. Monograph Vol. 3 No. 5
2. Monograph Vol. 4 No. 8
3. Monograph Vol. 5 No. 1
4. Monograph Vol. 5 No. 2
5. Monograph Vol. 5 No. 3
6. Monograph Vol. 5 No. 4
7. Monograph Vol. 5 No. 5
8. Monograph Vol. 5 No. 5
9. Monograph Vol. 2 No. 8
10. NUCCA 1971-1993
11. NUCCA News 1968
12. Monograph Vol. 1 No. 2
13. Monograph Vol. 1 No. 7
14. Monograph Vol. 2 No. 2
15. Monograph Vol. 2 No. 5
16. Monograph Vol. 1 No. 10
17. Monograph Vol. 3 No. 6
18. Monograph Vol. 3 No. 4
19. Monograph Vol. 5 No. 5
20. Monograph Vol. 5 No. 4

Working with the Digital Inclinometer

by Marshall Dickholtz, Jr., D.C.

The digital inclinometer with remote readout is a device designed to allow a student or doctor to improve his/her adjusting abilities by having immediate and visual feedback relating to their body position during all the steps in the settleback phase through the completion of the adjustment.

Having the proper hip, shoulder and spinal angulation in relationship to the horizontal resultant is essential in order to reduce all the mechanical aspects of the subluxation back to normal. During the triceps pull phase any deviation of either the spinal lever or the parallel forces away from the correct reduction pathway will cause the cervical misalignment to reduce unproportionately thus creating an unstable or partial correction. When the adjustor does not have sufficient feedback of knowledge about his/her position during the adjustment the subluxation will not completely reduce and it will be difficult to interpret where the error lies from the post x-rays alone.

Dr. Gregory wrote, "If at the moment of the triceps pull when the doctor activates the adjustment if he is not accurately and properly positioned, he will fail to effectively reduce atlas laterality, spinous rotation, odontoid laterality, lower cervical rotations and cervical kink. The adjustor must develop a sense of feedback that will enable him to know if the shoulder lever, hip lever and spinal lever are at a 90 degree angle to the Notch Transverse Resultant."

The digital inclinometer with a remote readout that can be seen next to a coordinator during adjusting practice allows the doctor to clearly visualize how his/her hip and shoulder lever are positioned. This feedback produces the immediate kinetic perception that will build the necessary engrams or correct habits allowing for a consistent ability to reproduce the correct adjusting position while working with patients. The result is a more complete and predictable reduction of the subluxation.

Up to now if a doctor wanted to know if his parallel forces were properly aligned an assistant with a hand-held inclinometer could check the position of the pelvic lever and the shoulder lever and then read the result to the individual practicing his adjusting skills. The hand-held inclinometer is a useful tool. However its drawbacks are that it requires an additional person to assist and read the degrees of angulation. The measurements were routinely performed only at the completion of the conversion or pelvic lever phases.

The digital inclinometer unit is made up of three individual electronic levels that are attached to straps that are worn by the adjustor. When the doctor wears the device like a vest this places a level laterally across the sacral region and the upper dorsal area between the shoulder girdle and an additional level vertically along the mid dorsal region. Each one of these levels has a small gauge wire connecting them with three separate digital readouts. Every angle that the shoulder lever, spinal lever and pelvic lever move into during the 8 phases of the adjustment are readily seen.

Using the digital inclinometer has been a tremendous aid in helping me improve the control of my parallel forces and having them be perpendicular to the Notch Transverse Resultant. The unique benefit of using the digital inclinometer while practicing on the coordinator is that it illustrates errors as they occur as opposed to finding out that the parallel forces are not coplanar or aligned to the degree of angulation needed for a specific subluxation at the end of all the adjustive phases. There is no longer need to compensate for lost angulation when you can see how to maintain it as you go. The following is a list of the specific areas that the digital inclinometer illustrated thus showing how practicing proper form is essential.

In the approach phase the doctor sets up his base of support. The digital inclinometer shows the importance of having an adequate A-P foot spread. If after you have stepped forward and you see that you only have a few degrees of angulation and your goal is to end up with 21 degrees for a listing of H5A5, you may want to extend your A-P foot spread so you will be starting off with greater pelvic angulation. Along with initiating both the plantar and neck reflex also be aware that the angulation of the pelvis and shoulders are close to the same.

In the settleback phase if the weight is not over the outside foot with a lock action against the anterior aspect of the outside hip the degree of pelvic angulation will not increase. I noticed a tendency to drop the outside shoulder which seemed to follow the increased angulation of the pelvis but the digital inclinometer showed that this only caused the shoulder girdle to angulate faster or more than the pelvic girdle. If the doctor were to bend over as opposed to settling back this would show up on the dorsal readout as a drop in degrees as well as the lack of increased pelvic angulation.

I noticed also how maintaining the same angulation of the pelvis and shoulder through the turn-in, arch and roll-in phases made going into the conversion phase that much easier. The purpose of the conversion phase is to convert the parallel forces to a more vertical plane. Thus being able to <u>feel</u> the change in angulation as well as <u>see</u> the degrees of angulation change evenly at the same time in both the shoulders and pelvic levers is an exceptional form of feedback.

The pelvic lever phase is probably only necessary on listings requiring more than 24 degrees of angulation. By using the digital inclinometer the doctor is able to see when this increase is required for a specific adjustment.

When the triceps pull phase is being performed we usually are no longer concentrating on our parallel forces. Using the digital inclinometer and watching to see that the angulation of the spinal, pelvic and shoulder levers remain the same also aids in staying out and coplanar at the end of the horizontal resultant.

Another big insight that using the digital inclinometer has brought is always knowing the necessary angulation of every subluxation. The correction of patients' misalignments requires more than the knowledge of the height and rotation vectors. The doctor's effectiveness is not only based on being able to perform all the steps in the adjustment accurately but they also must know what degree of angulation is needed to reduce any specific subluxation. Too much angulation is no better than not

enough. By practicing correctly, knowing what degree of angulation is necessary and keeping the parallel forces aligned, allows for more consistent performance when caring for the patients. The digital inclinometer is proving to be a valuable aid in helping chiropractors develop and perfect their adjusting abilities and in providing a more complete correction of the C-1 subluxation.

	1	2	3	4	5	6	7	8	9
1	6	8	11	14	17	20	23	26	29
2	8	10	12	15	18	21	24	27	30
3	11	12	15	17	19	22	25	28	31
4	14	15	17	19	21	23	26	29	32
5	17	18	19	21	23	25	27	30	34
6	20	21	22	23	25	27	29	32	35
7	23	24	25	26	27	29	32	33	37
8	26	27	28	29	30	32	33	36	38
9	29	30	31	32	34	35	37	38	40

Figure 1

Pelvic and shoulder angulation
for various listings



Figure 2

Digital inclinometer harness

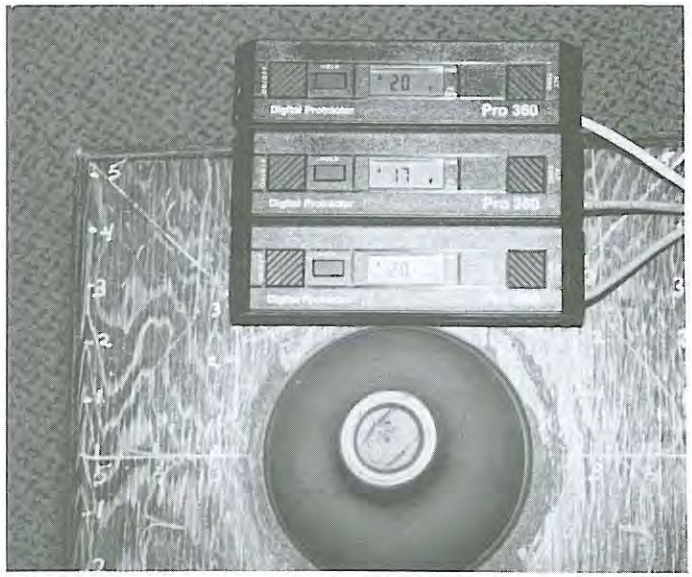


Figure 3

Remote readout

The Triceps Pull and Adjustment

by Steven N. MacDonald, D.C.

The purpose of this article is to simplify the adjustment for NUCCA doctors. There have been too many doctors who have given up the NUCCA work and others who struggle because they believe that it is too difficult to learn. I believe that this is only true for those who do not have a clear understanding of the anatomy and proper mechanics involved. When doctors have taken the time to educate themselves or have been taught correctly, the triceps pull and adjustment becomes simpler and more efficient for them. Doctors also will not hurt themselves adjusting patients if they have the correct understanding of the process involved.

First one must realize that there is a difference between the triceps pull and the adjustment. The triceps pull involves the mechanics of pulling the long head of the triceps muscle, compressing the shoulder girdle and other mechanics involved in the closed ring of the adjusting hands, arms, shoulders and episternal notch. The triceps pull is not the adjustment of the atlas vertebra. The adjustment occurs when the atlas vertebra reduces in its misalignment to its correct alignment as a result of the triceps pull. There is no adjustment if there is not a correction in the misalignment of the atlas vertebra and thus reduction of neurological encroachment.

For a proper triceps pull, the humeral heads should be in the posterior one-third position of the glenoid fossa. It is important to visualize the glenoid fossa divided evenly, anterior to posterior, into three sections. If one were to raise his arm to a 90 degree angle with the arm projecting forward anteriorly, this would set the humeral head in the *anterior* one-third of the glenoid fossa. Now pulling the humeral head posteriorly into the center of the glenoid fossa will place the humeral head in the *center* one-third of the glenoid fossa. To snugly pull the humeral head farther posterior in the fossa will place the humeral head in the *posterior* one-third of the glenoid fossa. In the adjustment this posterior one-third is the proper position in the glenoid fossa for the humeral head. Any further posterior would be too far and the force of the triceps pull would be lost behind the shoulder girdle and would consequently be ineffective.

It is important for the doctor to understand and visualize the origin and insertion of the triceps muscle and the long head attachment of the triceps muscle. The triceps muscle inserts on to the olecranon process of the ulna bone and the long head attaches into the infraglenoid tuberosity of the scapula (see figs. 1&2). It is important to be able to visualize the infraglenoid tuberosity just below the inferior rim of the glenoid fossa on the lateral side of the scapula. If one can visualize the glenoid fossa and the infraglenoid tubercle, then one can visualize the long head of the triceps attaching to this tubercle (see fig. 3). This tubercle is the location of the beginning of the triceps pull. This is the proper anatomical location to visualize in beginning the pull of the triceps long head.

The line of pull is a straight line between the insertion of the triceps on the olecranon process of the ulna bone, and the muscle origin of its long head on the infraglenoid tuberosity of the scapula. The direction of the line of pull is upward toward the glenoid fossa. Initiate the triceps pull just one-quarter of an inch below the center of the fossa, which would be in the exact location of the infraglenoid tuberosity.

The doctor should not activate the triceps muscle below the elbow. Such action moves the elbow joint first causing too much force, depth and lack of control in the adjustment. The triceps long head is correctly pulled just below the shoulder joint. The doctor needs to activate the shoulder girdle first. The shoulder girdle is the greatest lever in the adjustment, because it is the largest. This is what the doctor is adjusting against; it is the doctor's foundation and strength that will cause the atlas to move under its great force.

In the triceps pull the doctor pulls the long head of the triceps back against the infraglenoid tuberosity with a straight line of pull from the olecranon process to the center of the glenoid cavity. There is a slight backward movement of each shoulder, followed by complete shoulder girdle compression. The scapulae will follow the shoulder girdle compression medially. The scapulae should not *lead* the shoulder girdle compression, only *follow* the compression.

As the doctor contacts the atlas transverse process, the pressure of the pisiform on the atlas vertebrae always remains the same throughout the adjustment. It should be no different at the time of the adjustment than it was at the time of first taking contact. It is a firm contact of the atlas transverse process that remains the same throughout the triceps pull.

The doctor overcomes the resistance of the subluxation by overcoming the resistance of his/her own shoulder girdle. As the doctor contacts the atlas vertebra, he/she pulls the long head of the triceps muscle in a straight line to the center of the glenoid fossa compressing the shoulder girdle, thus compressing the closed chain ring that has been formed between the patient's atlas vertebra, the doctor's adjusting arms and shoulder girdle. This adjustic chain is set into action when the resistance of the shoulder girdle is overcome. If ten pounds of force is the amount required to overcome and correct a subluxation, the vertebrae will move at the same instant the adjustor's triceps brachii have exerted ten pounds of force against his/her own shoulder girdle. This is a built-in mechanism in the adjustor that controls force and protects the patient. The doctor cannot use the same amount of force for every subluxation, it would be harmful and impractical. Each subluxation has its own resistance so that each subluxation has its own individual adjustment.

The adjustment force must be delivered in the fraction of a second that it meets the resistance of the subluxation. It should be a surprise to the adjustor! If the adjustor tries to force the atlas to move, then the adjustor could push the atlas. The adjustor could then jam the subluxation or force the subluxation into a different pattern, or the atlas could possibly rebound and increase in its misalignment.

The adjustor must remember that the atlas corrects properly if it moves as a result of the adjustor overcoming the resistance of his/her own shoulder girdle. Once this pressure builds to a greater level than the resistance of the subluxation, then at that instant the adjustment is made.

With proper understanding and correct visualization the adjustment can be simpler for the doctor. Hopefully this article will help the doctor's understanding of the proper mechanics involved in the adjustment.

References:

1. Gray's Anatomy, 35th British edition, Philadelphia, W.B. Saunders Co., 1973, 319-321, 539-542.
2. Gregory, R. "How to Adjust the Atlas Subluxation Complex: The Triceps' Pull Phase," Upper Cerv. Mono., Jan., 1978, 2(4),3-5.
3. Pond, L., Pond, L., "The Mechanics of the Shoulder Compression," Upper Cerv. Mono., Sep. 1991, 5(2),2-3.

Illustrations by Emily Ann MacDonald

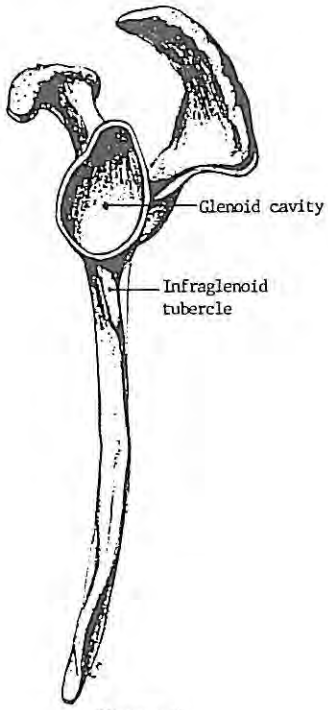


Figure 1

Lateral aspect of left scapula. Note location of infraglenoid tubercle.

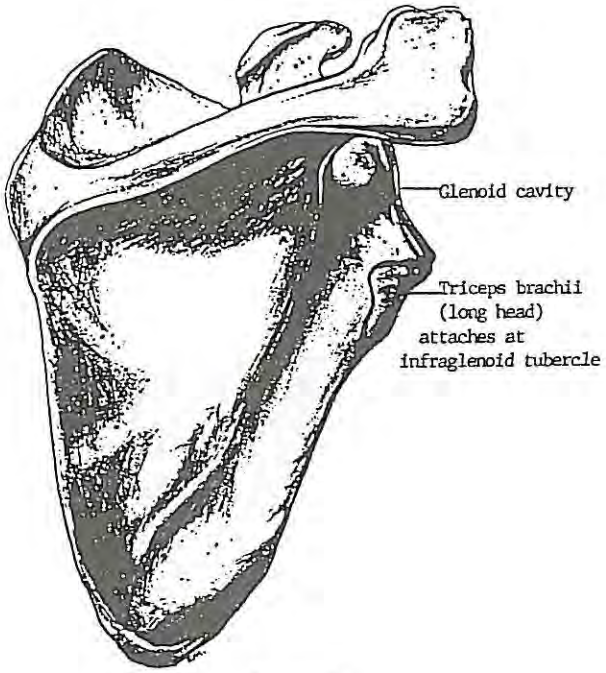


Figure 2

Dorsal aspect of right scapula. Note attachment of triceps brachii (long head) into infraglenoid tubercle.

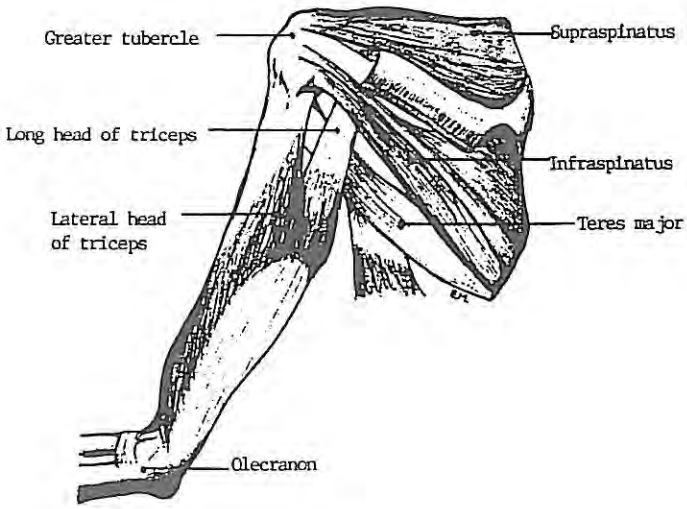


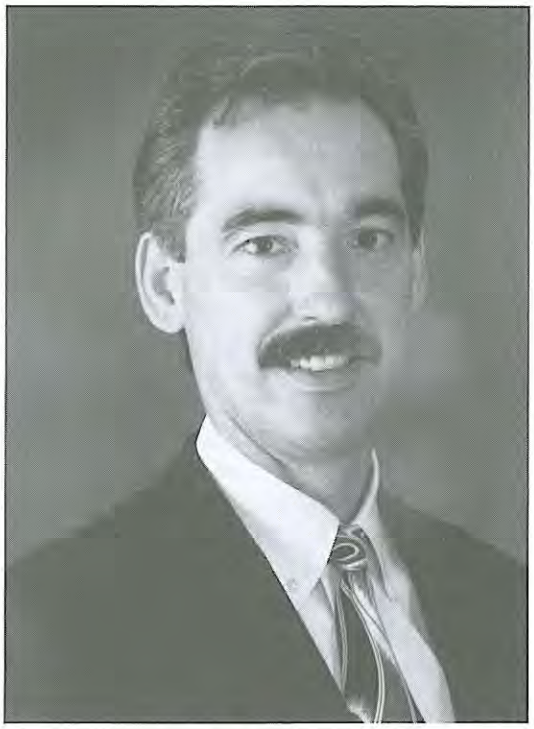
Figure 3

Dorsal scapular muscles. Left side. Note long head and lateral head of triceps brachii.

TRICEPS PULL ILLUSTRATIONS

Drs. John Dunn and Lee Yardley Receive NUCCA Certification

The NUCCA Board of Directors take pride in announcing that Drs. Dunn and Yardley have completed all requirements for certification. Both Drs. are long standing members of NUCCA.



Dr. John Dunn



Dr. Lee Yardley

Dr. John Dunn practices in Tallahassee, Florida. He's a 1979 graduate of Palmer College of Chiropractic and is married to Barbara McNeal, an Ironman triathlete.

A childhood accident caused an arthritic condition that didn't go away until he was adjusted by Dr. Marshall Dickholtz, Sr. in 1977.

Dr. Marshall Dickholtz, Jr. was his mentor during the certification process. "Without his help, this great honor wouldn't have been possible. Thank you, Marshall."

Dr. Lee Yardley, a native of New Zealand, graduated from Palmer College of Chiropractic in 1978. In 1988 he developed a health problem that failed to respond to the more usual chiropractic approaches. Upon the recommendation of Dr. Chuck Gibson and the urging of Dr. Ed Stein he sought care from Dr. Al Berti. He was so impressed with the results and the approach that this led to his pursuit of training in NUCCA and ultimately the conversion of his practice to NUCCA exclusively.

Dr. Yardley would like to express his deepest appreciation to Dr. Al Berti for his care, inspiration, and unending patience; and to Dr. Ed Stein and Dr. Otto Portmann for their ongoing support and encouragement.

A Review of "Comparisons of Lordotic Cervical Spine Curvatures to a Theoretical Ideal Model of the Static Sagittal Cervical Spine," an article by Donald D. Harrison, T.J. Janik, S.J. Troyanovich, and B. Holland Spine, Vol. 21, No. 6, March 15, 1996.

by James Palmer, Professor
The University of Toledo

The reviewer acknowledges both Spine and JMPT, and commends D.D. Harrison, D.C. for his publishing productivity. The reader is directed to Spine, Vol. 21, No. 6, March 15, 1996 and JMPT, Vol. 19, No. 8, October 1996, for referenced drawings discussed in this review.

According to the authors, the earliest days of spinal modeling began in the 1950s in an effort to explain symptoms and spinal injuries in Air Force pilots. Harrison et al. use pain symptomatology in which spinal ligaments and discs have been implicated to argue that normal spinal position as determined by modeling be considered as a treatment outcome. If the spine was "normalized" then the deforming forces on the nociceptors, mechanoreceptors, and proprioceptors would be minimized.

The earliest reference to cervical curvature provided by Harrison et al. was by Suh (1975) who used a "three-point scheme to draw arbitrarily an arch of a circle for the cervical lordosis, thoracic kyphosis, and lumbar lordosis." The only other reference provided concerning the cervical region was by Pal and Sherk (Spine, 1988) who showed a lordotic configuration is mechanically required.

Spinal models are classified into two groups - geometric and mechanical. The mechanical group uses forces to explain shape; the geometric group describes the shape. Harrison et al. stated that "because existing models do not attempt a mechanical engineering solution of an ideal static normal position," they (the authors) present a static geometric model as the solution.

The authors geometric model is defined by: $\frac{H}{L} = \frac{SIN\,\theta}{\theta}$

H = čord length (height)

L = circular arc length

2θ = central angle subtended by arc length L; the radii forming the angle if extended would be tangent to the superior surface of C1 and to the inferior surface of T1 (see figures 1 & 2)

Basic assumptions of the model are:

(1) cervical lordosis is a circular arc;

(2) cervical lordosis extends from superior C1 to inferior body margin of T1;

(3) cervical disc height to vertical body height is in ratio of 2:5;

(4) C2 has a vertical body height equal to one other cervical plus one disc height;

(5) the "atlas plane line" is through the midlateral mass;

(6) lines drawn along the posterior vertebral body are tangent at midbody.

These assumptions allow a simple set of equations to define the model. The reader should note that the authors' "atlas plane line" is in the lateral x-ray view (not the nasium x-ray view) and is similar to, but not the same as, the NUCCA S-line.

The database in the study consists of four hundred (400) randomly selected lateral cervical radiographs from a Massachusetts chiropractic clinic. For x-rays to be acceptable, C1-C7 had to be clearly visualized and the curvature had to be "lordotic." No mention was made of post x-rays, x-ray alignment, or magnification.

Patients while standing with right shoulder closest to the grid with eyes closed flexed and extended their heads before coming to a "comfortable neutral resting position." The authors state that this is a valid way to achieve positioning reliability.[1]

Seven angles and two distances were measured as follows:

(1) the angle between the "atlas plane line" and a horizontal APA; (see fig. 3A in the Spine article)

(2) the perpendicular, "S," from a vertical axis line (which originates at the posteroinferior corner of the body of C7) to the "posterior base of the dens of axis."

(It is assumed that "posterior base of the dens of axis" is equivalent to "a point on the posterosuperior body margin of C2" and is as shown.) This distance is used by the authors as a measure of the anterior weight bearing of the head.

(3) the "absolute rotation angle" (ARA) measured using R. Jackson's stress lines for C2 and C7; it is the acute angle so formed. A stress line is a line containing the posterosuperior and posteroinferior vertebral body margin points. (2 per vertebra)

(4) Five "relative rotation angles" (RRA) determined using Ruth Jackson's stress lines on pairs of adjacent vertebra, i.e., C2-C3, C3-C4, etc. These are "angles of extension"; and

(5) the distance used for the arc length was from the posteroinferior corner of C7 to the base of the dens as measured along the posterior longitudinal ligament.

Of the 400 subjects in the study, 237 were male and 163 were female. The average age was 35.4 years with the youngest being 5 years and the oldest being 79 years. If the age distribution of the 400 subjects fit a statistical standard normal distribution

and using the study's average standard deviation of approximately 14 years, then one can reasonably conclude that approximately 16% (64) of the subjects were 21 years of age or younger and approximately 6% (24) of the subjects were 13 years of age or younger.

In this reviewer's opinion, it unfortunate that the authors did not separate out these 24-64 subjects to see what effect they had on the results, including the efficacy of the model. Many readers might hypothesize that the greatest variation in lordosis would exist in subjects in their formative years, since the cervical curve is a secondary curve.

Results of the study include (1) an average "atlas plane line" inclination of 24°, (2) an anterior weight bearing of 15.5 mm (no source to film distance is provided; i.e., no magnification factor), (3) magnitude of the average lordotic angle (absolute rotation angle) of 34° with a range of 16.5°-66°, and (4) magnitude of relative rotation angle of 6.5 degrees. The authors' geometric model agreed with the radiographic measurements with an average difference of 5 percent.

It should be kept in mind that the authors excluded kypotic and "miltary" curvature. Although Harrison et al. cite studies that argue for a small percentage of the general population having kyphotic configurations, they argue the case for lordotic configuration in the cervical spine being a necessity for a normal state. They cite studies associating kyphosis with adverse tension in the CNS and increased incidence of spinal stenosis, arguing for increased loading on the vertebral bodies and discs requiring increased extensor muscle effort in maintaining equilibrium, and suggesting greater degenerative changes in injury cases.

Of the differences in the female population compared to the male population in the group of 400 cases, this reviewer sees the female having a 2% larger average in the "atlas plane angle" than the males — a statistically significant difference as pointed out by the authors. Although the average absolute rotation angles were essentially the same for both genders, the females had a 1.5 degree greater relative rotation angle for C2-C3 (20% larger than males) but a 2.0 degree smaller relative rotation angle for C6-C7 (25% smaller than males). This reviewer would have appreciated a recognition and discussion of this observation. Is it explained by stating that a larger "atlas plane angle" requires less relative curvature in the lower cervicals?

Table I in the J.M.P.T. article is a composite of a large portion of the data presented in the paper under review.

Group I contains all 400 cases used in the study; this group is characterized by lordotic cervical curvature without "flexed intersegmental positions." The combined column was calculated by this reviewer using weighted averages based on the authors' data.

Group II is a subset of the 400 cases who, according to Harrison et al., did not have "cervicocranial symptoms." This does not, according to the authors, rule out previous trauma. Group II has the potential of being a more appropriate population for defining a normal lordotic curvature than the universe of 400 cases. Based on the values of the averages in Group II and the combined averages in Group I, the populations appear to be essentially the same. This is somewhat to be expected because the cases of Group II comprise the majority of Group I cases. It is unfortunate that the authors did not provide a comparison column for the 148 cases who did have "cervicocranial symptoms."

Group III consists of 83 cases fitting the Delmas Normal Ideal Range (.94 to .96) in height-to-length ratio. (See Kapandji The Physiology of the Joints, 1974 Viii:20,29) The reader should notice in Table I that the "Atlas Rotation Angle" and the absolute rotation angle show very large differences when compared to Group I and Group II.

Group IV consists of 69 cases having a relative rotation angle of greater than 20 degrees — definitely a lateral kink! This reviewer would have appreciated a tally of frequency at level of cervicals involved.

Group V consists of 150 cases with all relative rotation angles being between magnitudes of 1 and 11 degrees. The authors chose this criteria because the literature reports "that the average sum of flexion-extension at any adjacent pair of cervical vertebrae is less than 21° (more flexion)...thus an RRA of 11° would be considered abnormal if such a large value occurred in a neutral lordosis." This group has a significantly smaller average absolute rotation angle and the smallest "atlas angle" of all groups.

This reviewer would have appreciated knowing the number of cases that satisfied both Group II and Group V criteria suggesting a different ideal normal.

This reviewer encourages doctors who read this review article to compile their own data base so that an "ideal normal lordotic cervical curve" could be more fully established.

Bibliography:

1. Jackson, B.L., Harrison, D.D., Robertson, G.A., Barker, W.F. Chiropractic Biophysics Lateral Cervical Film Analysis Reliability. JMPT, Vol. 16, No. 6, July/August 1993.
2. Harrison, D.D., Janik, T.J., Harrison, G.R., Troyanovich, S.J., et al. Chiropractic Biophysics Technique: A Linear Algebra Approach to Posture in Chiropractic. JMPT, Vol. 19, No. 8, October 1996.

NUCCA NEWS
Published by THE NATIONAL UPPER CERVICAL CHIROPRACTIC ASSOCIATION, INC.

Mentoring Program for Field Doctors Inaugurated

NUCCA is happy to announce that a mentoring program for field doctors has been inaugurated at the Fall Seminar. This opportunity is for doctors who are not currently in the certification process but would like to pair with one of the more experienced NUCCA practitioners. A mentor would provide information and counsel as problems develop for the mentee. The mentor is not expected to provide externships, loan money or lend equipment to the mentee unless there is a mutual agreement between the two parties.

The volunteers have all agreed enthusiastically to be available so the mentee should not feel reluctant to make contact. The list of volunteers follows. Complete addresses can be found in the 1996-97 NUCCA Directory.

John Dunn, D.C.	Florida and Life College	904-222-1171
Bob Gilbert, D.C.	Iowa and Palmer College	319-326-3970
Cynthia Arp, D.C.	Iowa and Palmer College	319-322-2345
Vince Fitzpatrick, D.C.	Washington	509-926-1551
Ralph Holtby, D.C.	Oregon	503-923-0444
John Houtman, D.C.	California	916-877-1105
Steve MacDonald, D.C.	California and LifeWest	408-375-9528
Mike Zabelin, D.C.	California and Life West	415-931-5000
Larry Schrock, D.C.	Indiana	317-793-4664
Andy Shepherd, D.C.	Texas	512-447-6606
Milt Steele, D.C.	Washington	360-678-5400
Lee Yardley, D.C.	Washington	206-271-5103

Recent graduates may want to contact Trish Gregg, D.C. (512-479-7878) or Rick Nash, D.C. (918-587-7111) for help in their selection of a mentor. This is a unique effort in chiropractic and all are urged to take advantage of this opportunity.

Dan Seemann, Ph.D.

Adjusting Chapter Completed

The publication committee has recently received "Adjusting the Atlas Subluxation Complex" from Dr. Lloyd Pond. The draft originally written by Dr. Ralph R. Gregory and revised by Dr. Pond this past year will contain many new photographs with computer enhancements to aid the practitioner in developing his/her adjusting skills. The NUCCA/NUCCRA boards wish to thank Dr. Pond for all his time and effort in preparing this most important chapter to the NUCCA Procedure Manual.

NUCCRA Research Meeting

February 8 & 9, 1997, certified doctors and those doctors with part 2 certification completed, attended a long range planning session for the NUCCRA organization. The meeting was held at the Double Tree Hotel in Monterey, California. Dr. Seemann and Dr. Berti shared the duties as facilitators for the sessions. Approximately 15 doctors attended. NUCCRA research was divided into three main categories: clinical or applied research, validation research, and basic or spinal model research. The participants were able to provide many new projects in each of the three categories. Dr. Seemann presented current projects and James Palmer presented proposals for data base projects and outcome assessment projects. The NUCCRA board wishes to thank Dr. Steven M. MacDonald for arranging the meeting.

NOTICE

The Board of Directors wish to announce that a new policy has been adopted regarding the use of audio visual equipment. No video cameras, tape recorders, etc. will be allowed in the conference rooms during the seminars. Your cooperation is appreciated.

1997-98 NUCCA Directory

The NUCCA directory will be published following the May '97 Convention. The directory contains the names, addresses and phone numbers of Doctors who have paid their annual dues. With the exception of Certified Doctors, this directory makes no attempt to qualify individual expertise or right to practice Chiropractic in any jurisdiction. Contact the NUCCA Executive Secretary regarding any corrections, omissions, or deletions. Directory information is due by April, 1997. This directory will be published every May.

New NUCCA Policy Re Techniques

The National Upper Cervical Chiropractic Association, Inc. (NUCCA) has adopted the policy that any chiropractic technique taught in NUCCA conventions and/or seminars must have the prior approval of the research board (NUCCRA).

This NUCCA policy insures that all techniques taught in NUCCA conventions and seminars must meet the same rigid research requirements that are imposed on those techniques now taught by NUCCA.

These requirements include: (1) proof of the existence of the misalignment factors of the subluxation (x-ray); (2) proof of the maximum reduction of the misalignment factors by the act of the adjustment (post x-ray); (3) evidence of the detrimental effects of the misalignment factors on the neurological component; (4) evidence of the reduction of the deformation of the neurological component by the misalignment factors; (5) physical proof that the subluxation does adversely influence the human organism, and (6) a system of measurement by which the physical effects of the subluxation can be accurately determined and which will provide proof of their reduction and ultimate removal by the correction of the subluxation (Anatometer).

Doctors desiring to submit original research to the National Upper Cervical Chiropractic Research Association, Inc. (NUCCRA) must first prepare a written detailed report of their research work for submission to the NUCCRA board members. Upon acceptance of the report by the board, an opportunity will be afforded the submitting doctor to appear before the board to present his research work in person, and to answer any questions that may have arisen regarding his work. Full credit will be given to the doctor for his original research upon approval by the NUCCRA board.

Interested doctors may obtain further information by writing NUCCRA, 221 West Second Street, Monroe, Michigan 48161.

NATIONAL UPPER CERVICAL CHIROPRACTIC ASSOCIATION, INC.

A NON-PROFIT CHIROPRACTIC ORGANIZATION
APPLICATION FOR MEMBERSHIP

I hereby apply for membership in the NATIONAL UPPER CERVICAL CHIROPRACTIC ASSOCIATION, INC. (NUCCA)

- ☐ **ACTIVE MEMBERS: In Practice Over 2 Years:** Dues $100.00 per year.
- ☐ **ACTIVE MEMBERS: 1st and 2nd Year Doctors:** Dues $50.00 per year.
- ☐ **STUDENT MEMBERS:** Dues $25.00 per year.
- ☐ **LIFETIME MEMBERS:** Dues $2,000.00.
- ☐ **ACADEMIC MEMBERS:** Dues $50.00 per year.
- ☐ **SUPPORTIVE MEMBERS:** Dues $25.00 per year.
- ☐ **RETIRED MEMBERS:** Dues $25.00 per year.
- ☐ **HONORARY MEMBERS:**

Directory Information Due April, 1996

NAME_____ AGE_____

ADDRESS_____ CITY_____ STATE_____ ZIP_____

CHIROPRACTIC COLLEGE (ATTENDING OR GRADUATED FROM)_____

I AM LICENSED TO PRACTICE CHIROPRACTIC IN THE FOLLOWING STATES:_____

_____ YEARS IN PRACTICE_____

DATE:_____ SIGNATURE:_____

MAKE CHECK PAYABLE TO:

NATIONAL UPPER CERVICAL CHIROPRACTIC ASSOCIATION, INC.

MAIL TO: **NUCCA**
217 West Second Street
Monroe, Michigan 48161

MEMBERSHIP DESCRIPTION

ACTIVE MEMBERS shall be any graduate chiropractor from a chartered college or university of chiropractic who is in good standing in his/her state of residence, who has applied for membership, and who has paid his/her annual dues. Active members shall have the rights and privileges of membership, be eligible to vote, and to hold elective office.
Seminar fees for active members are:

$400.00 in practice over 2 years
$200.00 1st and 2nd year Doctors
$150.00 Students

Members will receive a 10% discount on all NUCCA supplies.

LIFETIME MEMBERS shall be Active Members who pay lifetime dues to NUCCA and shall have all of the rights and privileges of Active Members.

ACADEMIC MEMBERS shall be members of the faculty, research department, or administration of chartered colleges or universities who are in good standing and have paid annual academic dues. Academic Members are entitled to attend NUCCA membership meetings and to address the assembly, but are not able to make motions, vote, or hold elective office.

STUDENT MEMBERS shall be chiropractic students who have applied to or are actively enrolled in a charter college or university of chiropractic who have paid annual student dues. They are entitled to attend NUCCA membership meetings and to address the assembly but are not eligible to make motions, vote, or hold elective office.

SUPPORTIVE MEMBERS shall be NUCCA friends, family, and patients who desire to contribute dues and/or other gifts for the advancement and support of NUCCA. They are entitled to attend NUCCA membership meetings and to address the assembly but are not eligible to make motions, vote, or hold elective office.

RETIRED MEMBERS shall be former Active, Academic, or Supportive Members who have achieved retirement and who wish to retain membership in their previous category. Retired members are excluded from holding office.

HONORARY MEMBERS are persons other than student or graduate chiropractors who have demonstrated outstanding devotion and service to NUCCA. Honorary Members shall be recommended by a member of NUCCA and elected by a majority vote of the Board of Directors. They shall not pay dues, be entitled to vote, or hold elective office.

NOTICE

Donations to NUCCA are **not** deductible under NUCCA's tax status. Dues and purchases of equipment are deductible, as from any organization. Donations to NUCCRA **are** deductible under NUCCRA's private foundation status.

The 30th Annual NUCCA Conference

Co-sponsored by Palmer College of Chiropractic

May 29, 30, 31 and June 1, 1997 — San Francisco, California

Basic Class Schedule

THU. May 29, 1997

1:00 pm to 1:50 pm	Registration
2:00 pm to 2:30 pm	Welcome
2:30 pm to 3:45 pm	Intro to NUCCA Biomechanics of Four Basic Types
3:45 pm to 4:00 pm	*Break*
4:00 pm to 5:00 pm	Basic X-ray Analysis
5:00 pm	*Adjourn*
7:00 pm to 9:00 pm	Membership Open Forum

FRI. May 30, 1997

9:00 am to 10:30 am	Basic X-ray Analysis
10:30 am to 11:00 am	Break Order NUCCA Supplies
10:45 am to 12 noon	*Continuation of X-ray Analysis*
12 noon to 1:15 pm	*Lunch*
1:30 pm to 2:45 pm	*Continuation of X-ray Analysis*
2:45 pm to 3:00 pm	*Break*
3:00 pm to 4:45 pm	*Continuation of X-ray Analysis*
4:45 pm to 5:00 pm	Questions; Adjourn

SAT. May 31, 1997

8:00 am to 9:00 am	Open Discussion
9:00 am to 10:15 am	Adjusting
10:15 am to 10:30 am	*Break*
10:30 am to 12 noon	Adjusting
12 noon to 1:15 pm	*Lunch*
1:30 pm to 3:00 pm	Research Update
3:00 pm to 3:15 pm	*Break*
3:15 pm to 5:00 pm	NUCCA Business Meeting
5:00 pm	Adjourn
6:00 pm to 7:00 pm	Cocktails - No host bar
7:00 to 10:00 pm	Banquet

SUN. June 1, 1997

8:00 to 9:00 am	Open Discussion
9:00 am to 10:30 am	Headpiece Placement/ Leg Check
10:30 am to 10:45 am	*Break*
10:45 am to 12 noon	X-ray Positioning Video
12 noon to 1:15 pm	*Lunch*
1:30 pm to 2:45 pm	Doctors Choice A. X-ray analysis errors B. Headpiece Placement/ Leg Check C. Adjusting
2:45 pm to 3:00 pm	*Break*
3:00 pm to 4:30 pm	Questions, Comments Seminar Wrap-Up
4:30 pm	Adjourn
6:00 pm to 7:00 pm	Cocktails - No host bar
7:00 to 10:00 pm	Banquet

Advanced Doctor's Schedule

THU. May 29, 1997

1:00 pm to 1:50 pm	Registration
2:00 to 2:30 pm	Welcome
2:30 pm to 3:45 pm	Adjusting Procedure Evaluation
3:45 pm to 4:00 pm	*Break*
4:00 pm to 4:45 pm	Discussion of Adjusting Problems
4:45 pm to 5:00 pm	Questions - Adjourn
7:00 pm to 9:00 pm	Membership Open Forum

FRI. May 30, 1997

9:00 am to 10:30 am	Correcting Adjusting Errors
10:30 am to 11:00 am	Break: Order NUCCA Supplies
11:00 to 12 noon	*Adjusting*
12 noon to 1:15 pm	Lunch
1:30 pm to 2:45 pm	*Adjusting*
2:45 pm to 3:00 pm	Break
3:00 pm to 4:45 pm	X-ray Analysis Positive Prints (bring instruments)
4:45 pm to 5:00 pm	*Questions - Adjourn*

SAT. May 31, 1997

8:00 am to 9:00 am	Open Discussion
9:00 am to 10:15 am	Intermediate Biomechanics
10:15 am to 10:30 am	*Break*
10:30 am to 12 noon	Leg Check Headpiece Placement
12 noon to 1:15 pm	*Lunch*
1:30 pm to 3:00 pm	Research Update
3:00 pm to 3:15 pm	Break
3:15 pm to 5:00 pm	*NUCCA Business Meeting* *Election of Board of Directors*
5:00 pm	*Adjourn*
6:00 pm to 7:00 pm	*Cocktails - No host bar*
7:00 pm to 10:00 pm	*Banquet*

SUN. June 1, 1997

8:00 am to 9:00 am	Open Discussion
9:00 am to 10:30 am	Advanced Biomechanics
10:30 am to 10:45 am	*Break*
10:45 am to 12 noon	Advanced Biomechanics
12:00 noon to 1:15 pm	*Lunch*
1:30 to 2:45 pm	Doctors Choice A. X-ray analysis errors B. Headpiece Placement/ Leg Check C. Adjusting
2:45 pm to 3:00 pm	*Break*
3:00 pm to 4:30 pm	Questions, Comments Seminar Wrap-up
4:30 pm	Adjourn

Hotel Information

San Francisco Airport Marriott Hotel
1800 Old Bayshore Highway
Burlingame, CA 94010

Phone: 415-692-9100

*Rooms will be held until
May 15, 1997

21 Hours of Continuing Education

License renewal is applied for in most states. Not all states approve all courses: therefore, check with your state to see if individual courses are acceptable for license renewal. Doctors must have their license number and be monitored.

Seminar Fees

	Members		Non-Members
D.C. (1st	$400	D.C. (1st	$500
D.C. 2nd Yr.)	$200	D.C. 2nd Yr.)	$250
Students	$150	Students	$175

Deadline Is: April 24, 1997

APPLICATION FORM
DEADLINE: April 24, 1997

O License - Renewal O Advanced Course O Basic Course

Name _____ Phone: ( ) _____

Address _____ Zip _____ Yrs. in Practice _____

Make checks payable to: **P.C.C.**

Mail to : NUCCA
217 W. Second St.
Monroe, MI 48161

Full fee must accompany this form.
Include: Banquet form
Registration form
Check or Money Order

Edna L. Denton Phone (313) 241-5755