



Predicting the Short Leg Using X-Ray Listings

By Daniel C. Seemann

Background

Predicting the short leg using x-ray listings or the predominant factor theory has been investigated for the past twenty years. (Gregory, 1969; Seemann, 1972, 1984, 1987, and 1988). With the help of the computer, the predictions are becoming more precise. Classifying the basic types and understanding the center of gravity of the skull has helped contribute to the predictions.

The data file used in the 1984, 1987, and 1988 studies N=1000, did not include important data such as plane line, type 4, cervical curve or head position. A hundred newer cases (n=100) were selected and the information was registered on the disk. Each patient has 18 pieces of data listed, for a total of 1800 facts of data. (Thanks to Dr. Keith Denton.)

The predominant factor studies are important because if the short leg can successfully be predicted using the x-ray listings at a high level of predictability, the relationship between the atlas subluxation and pelvic distortion (i.e., short leg, pelvic torque) will be further strengthened and support the NUCCA theory that an atlas subluxation **causes** pelvic distortion.

Comparison of Old & New Data

A comparison of three sets of data from 1972, 1984 and 1989 with regard to the incidence of anterior and posterior rotations is amazingly consistent. This consistency supports the high level of reliability used by the readers.

Table 1
Comparison of Three Data Bases

	1971	1984	1989
N	200	1000	100
Ant.	.68	.68	.68
Post.	.32	.32	.32

Table 2 compares the incidence of the basic types including the type 4. Previously it had been reported that the incidence of type 1 was 60%; type 2 was 34% and type 3 was 6%. Table 2 also reports the incidence of anterior rotations to posterior rotations by basic type. It is important to note that 91% of the posterior rotations are either

(Continued on page 2)

An Investigation Into The Validity of Laterality

By James F. Palmer

Professor of Technical Science and Mathematics
University of Toledo

Introduction/Method and Materials

Critics of upper cervical chiropractic analytical methodology and adjustive techniques as developed jointly by J. F. Grostic and R. R. Gregory and as refined by R. R. Gregory have consistently used data by nonexperts.¹ The bias, poor judgment, and confusion of one such study has recently been challenged in the literature.^{2-8, 14} The title of two indexed articles identifies the reliability of the x-ray marking system as the topic of research.^{1,3} In reality, the earlier of the two articles was dominated by the lack of expertise of the participants and by the inconsistencies and contradictions of the procedures used by the participants, and therefore was not a measure of the reliability of the x-ray marking system. These procedures were not consistent with those of board certified NUCCA practitioners.^{7,8,10-14}

This article makes use of the patient files of R. R. Gregory. Dr. Gregory is widely acknowledged as the dean of upper cervical chiropractic and as such has impeccable credentials. It should be noted that it is Dr. Gregory who scores the 10 **consecutive** sets of pre and post x-rays for doctors seeking NUCCA board certification. The x-rays must not only be analyzed correctly but the reductions must each be 80 percent or better to receive a passing score for this portion of the certification process.

The patient files used for this investigation center on 1958 (50 cases) and 1982 (108 cases). A comparison is made with the study by J. D. Grostic of J. F. Grostic's files of 1948, 1949, 1950, and 1963 (523 cases).⁹ Whereas Grostic's study involved atlas rotation and laterality, this study involves only laterality. Measurements in both studies were to the nearest 0.25 degrees. Laterality to the left was designed negative and laterality to the right as positive.

The first 50 cases in 1958 that had both pre and post x-rays marked were used in this study; the 108 cases centered in 1982 were consecutive; all pre and post x-rays were marked. Therefore, without exception, all 108 cases were consecutive and all were used in this investigation. In each case, the time frame for both pre and post x-rays was less than one week.

The year 1958 was chosen because it was between the two time periods in J. D. Grostic's study; this could also allow

(Continued on page 4)

Predicting the Short Leg Using X-Ray Listings

(Continued from page 1)

type 1 or type 4. A 1988 study (Seemann) indicated that 68% of posteriors were type 1.

Table 2
Incidence by Basic Type and Type Rotation

	N	Ant.	Post.	% Ant.
T1	52	31	21	.60
T2	23	20	3	.87
T3	7	7	0	1.00
T4	18	10	8	.56

These findings generally support the hypothesis postulated in the 1988 article about posterior rotations (Seemann) which theorized that with type 2 and 3 subluxations the center of gravity of the skull will fall toward the side of laterality or the short axis. With the weight of the skull falling on the short axis the skull will tend to rotate anteriorly. The data in table 2 supports the hypothesis with all type 3's and 87% of the type 2's. Type 1's and 4's are less predictable showing they are anteriors about 60% of the time, but as indicated above, 91% of all posteriors are either type 1 or 4.

Some New Data

The study done on lateral curves (Seemann, 1987) indicated basically three different types of cervical curves: lordotic (L), military (M), and kyphotic (K). The prediction was there would be more lordotic curves than the two other lateral curves. Table 3 indicates the prediction was correct: (L) curves occur 46%. What was a surprise was that (M) and (K) curves were about equally split. Table 3 also shows C curves with the basic types.

Table 3
Cervical Curves by Basic Types

	L-46	M-27	K-27
T-1	21	15	16
T-2	11	7	5
T-3	2	1	4
T-4	12	4	2

The data by types generally supports the over-all statistical distribution except there are more T 3's that are kyphotic, and disproportionately more T 4's that are lordotic.

From the lateral studies also comes the hypothesis that there might be a relationship between C curves and the sagittal line (S-lines). Table 4 reports the distribution of the C curves and S-lines. A possible prediction would be the higher the S-line the more lordotic the curve. Table 4 indicates generally the hypothesis is supported. The most common incidence is a lordotic curve with S3 sagittal line which occurs 60% rather than 46% of the time. The other somewhat anomalous number is a military curve and S2 sagittal curve. Normal would be 27% and it shows 43%.

Table 4
Cervical Curves and S-Lines

	L-46	M-27	K-27
S0	1	4	1
S1	3	3	7
S2	9	9	3
S3	29	7	13
S4	4	4	3

There is some new information regarding the condylar axial circles which might be helpful to the new practitioners. Table 5 and Table 6 show the most frequent condylar and axial circles that we found when analyzing x-rays. The ratio between the condylar and axial circles of course is a very important element in determining the height vector in the analysis.

Table 5
The Most Frequent Condylar Circle

	3.0	3.5	4.0
Percent	.36	.60	.04

Table 6
The Most Frequent Axial Circle

Axial Size	6	8
------------	---	---

Range: 4.5-12

Testing Some Hypotheses

HO: (1) In the article "Predominant Factor Re-examined" (1987), I predicted that with the new method of calculating the amount of the skull turning on the condyles . . . will give a clue to which leg will shorten. If there is a significant portion of laterality that is due to the skull turning, the prediction will be the leg will be ipsilateral.

HP: To test this hypothesis, I arbitrarily chose a head position that had turned more than ± 2 degrees. There were 20 cases that had an HP of 2 degrees or more. Of the 20 cases, 12 cases were ipsilateral which is only a 60% prediction rate. Therefore, the hypothesis is not supported. It is obvious that more variables have to be entered to get a higher prediction rate. If the basic type is considered, the prediction rate for type 2 & 3's improves to 80%.

HO: (2) A better prediction rate seems to occur when the (HP) head position is 0. For an example, when the HP is 0° , 21/25 cases were type 1's and only 4 were type 2.

A second hypothesis tested was: When the HP is 0° or contra lateral to laterality the skull will turn posterior.

With left laterality, 10/11 cases supported the hypothesis. With right laterality 12/21 cases supported the hypothesis. The prediction rate then is

22/32 cases which is only 69%.

Further examination of the data reveals that 8 of 21 right laterality cases were type 4's and 1 case was a type 2. If the nine cases are not used the prediction rate becomes 12/12. Including the 10 cases from left laterality, the prediction is 22/23 cases predicted which gives a 96% rate. This prediction would support the hypothesis. Refer to exhibit 1 for a clearer understanding of the hypothesis and the listings.

Exhibit 1

Hypothesis: If HP (head position) is equal to 0, or contralateral to laterality, there will be a posterior rotation.

1) Name:		2) File number:	
3) Lat: R 1.5*	4) Od:	5) Sp:	6) Rot: P3*
7) S Line:		8) LA: 9) C/A:	
10) Plane Line:	11) NV:	12) Type:	13) LC: R 1.5
14) Frontal:		15) Transverse: 16) Fixed Point:	
17) C Curve:		17) Lg Ck Data: 18) Head Pos.: 0*	

Note: Information was taken from actual files. Hypothesis was supported 29/32 cases.

Finding 8 type 4's and 1 type 2 helps explain the above hypothesis. When the HP = 0 or contra to laterality the prediction will be a posterior rotation and this makes sense. With type 4's the HP will usually turn away from the vertical axis which directs the center of gravity to the short axis or side of laterality, and with the short side the prediction will be an anterior rotation. The 8 type 4's were posterior which does not fit the prediction and suggest that these 8 cases were anomalous or out of pattern cases. It is probably true for the single type 2 case also.

HO: (3) The last hypothesis is: If HP and short leg (LC) are ipsilateral and laterality is contra lateral the subluxation will be a basic type 1 & 4 or if the HP and LC are ipsilateral, and laterality is ipsilateral the subluxation will be a basic type 2 or 3.

The results of the computer search showed that with HP was left (L) and LC was (L); 22/24 cases supported the hypothesis. With HP right and LC right; 13/14 cases supported the hypothesis. This gave a total figure of 35/38 or a 92% prediction rate. These totals would support the hypothesis. Exhibit 2 displays the type of listing which supports the hypothesis.

HP becomes very pivotal in predicting the short leg. Previously a hypothesis was made which involved usually two variables, i.e., if laterality is predominant the leg will shorten to the opposite side of laterality. Or if the subluxation is a basic type 2, the short leg will be on the same side as laterality. The hypotheses are not always true. Introducing a

Exhibit 2

Hypothesis: If HP (head position) and LC (leg check) are ipsilateral, and laterality is contralateral, a Type 1 will occur.

1) Name:		2) File number:	
3) Lat: R3*	4) Od:	5) Sp:	6) Rot:
7) S Line:		8) LA: 9) C/A:	
10) Plane Line:	11) NV:	12) Type: 1*	13) LC: L .5*
14) Frontal:		15) Transverse: 16) Fixed Point:	
17) C Curve:		17) Lg Ck Data: 18) Head Pos.: L .5*	

Note: Information taken from actual files. Hypothesis was supported 35/38 cases. This includes the hypothesis that if HP and LC are ipsilateral, and laterality is ipsilateral, a Type 2 subluxation will occur.

third variable improves the prediction. HP then seems to be important in predicting the short leg although when HP is 0, the variable did not help in predicting the short leg. The basic hypotheses were that if the subluxation is a type 1, the short leg would be opposite to laterality and if the subluxation was a type 2, the short leg would be ipsilateral. A computer search showed that in only 11 cases out of 25 when HP=0 the hypothesis was supported. Repeating from above, when HP=0, the basic type will usually be a type 1.

Conclusion

This study presented new data which should help in predicting the short leg. A major find was that type 2 & 3's generally are going to rotate anteriorly. Also helpful is the fact that type 4's are treated as type 1's but in some cases have similar characteristics to type 2 & 3's when the center of gravity and short axis is considered.

Perhaps the most important conclusion is that the prediction of the short leg is more complicated than involving two variables. Introducing the variable (HP) head position seems to have an influence on the type subluxation. Future research will support this conclusion.

References

1. Gregory, R. R., The ASC and Leg Imbalance. The NUCCA News, Vol. 1, No. 7, March 1969.
2. Seemann, D. C., A Statistical Analysis of Some Hypothesis About the Atlas Subluxation Complex. Paper presented at the NUCCA May Convention, 1971, Monroe, Michigan.
3. Seemann, D.C., Some Hypothesis As To How Rotations Are Produced With Cervical Subluxations. Upper Cervical Monograph, Vol. 3, No. 8, June 1984.
4. Seemann, D. C., The Predominant Factor Theory Re-examined. Upper Cervical Monograph, Vol. 4, No. 4, June 1987.
5. Seemann, D. C., Posterior Rotations. Upper Cervical Monograph, Vol. 4, No. 5, January 1988.
6. Seemann, D. C., An Analysis of the Lateral Cervical X-ray. Upper Cervical Monograph, Vol. 4, No. 3, January 1987.

An Investigation Into The Validity of Laterality

(Continued from page 1)

for a comparison between the two best upper cervical adjusters of that time and provide a baseline for more recent years in which the post x-ray has proven crucial to the advancement of upper cervical biomechanics.

The year 1982 was chosen because cases from this year (1) are part of the data base of 1000 cases used for predominant factor research, (2) are part of the data base that was used in the discovery of the four basic types, and (3) are sufficiently close to the present to illustrate the impact of NUCCA/NUCCRA via R. R. Gregory on the efficacy in the reduction of the atlas subluxation complex. Patient placement for the 1982 cases was done by Dr. K. E. Denton and Dr. T. A. Denton (Palmer), now both board certified NUCCA chiropractors.

Patient placement and analysis of x-rays (as well as adjusting) were done by the highest standards of NUCCA.^{10-13, 15-17} All computer work was mainframe with "minitab".

There were no cases with a measured zero atlas laterality before adjustment. All 158 cases had some laterality with a magnitude range of 0.75 to 9.00 degrees. Without exception, all post-adjustment x-rays showed reduced laterality when compared to the corresponding pre-adjustment x-rays; without exception the laterality on the post-adjustment x-rays was either zero or on the same side as the laterality on the pre-adjustment x-rays.

Results

TABLE #1

A comparison of Grostic (1948-1950, 1963) and Gregory (1958) on laterality. Pre- and post-adjustment means and standard deviations.

ADJUSTER	# CASES	PRE-ADJUSTMENT		POST-ADJUSTMENT	
		MEAN	STD. DEV.	MEAN	STD. DEV.
Gregory	50	3.01°	1.81°	0.87°	1.25°
Grostic	523	2.63°	1.49°	1.40°	1.60°

TABLE #2

A comparison of Grostic (1948-1950, 1963) and Gregory (1958) on laterality. Pre-adjustment and post-adjustment cases with 0.00 degrees laterality.

ADJUSTER	# CASES	PRE-ADJUSTMENT		POST-ADJUSTMENT	
		# CASES/PERCENT	# CASES/PERCENT	# CASES/PERCENT	# CASES/PERCENT
Gregory	50	0 / 0%		21 / 42%	
Grostic	523	0 / 0%		156 / 30%	

TABLE #3

A comparison of Grostic (1948-1950, 1963) and Gregory (1958) on laterality. Difference of pre-adjustment and post-adjustment means ($\Delta\bar{x}$); relative change of pre-adjustment and post-adjustment means $\frac{\Delta\bar{x}}{\bar{x} \text{ Pre}}$

ADJUSTER	$\Delta\bar{x}$	$\frac{\Delta\bar{x}}{\bar{x} \text{ Pre}}$	
		\bar{x}	Pre
Gregory	2.14°	.71	(71%)
Grostic	1.23°	.47	(47%)

TABLE #4

A comparison of Grostic (1948-1950, 1963) and Gregory (1982) on laterality. Pre- and post-adjustment means and standard deviations.

ADJUSTER	# CASES	PRE-ADJUSTMENT		POST-ADJUSTMENT	
		MEAN	STD. DEV.	MEAN	STD. DEV.
Gregory	108	2.64°	1.37°	0.23°	0.51°
Grostic	523	2.63°	1.49°	1.40°	1.60°

TABLE #5

A comparison of Grostic (1948-1950, 1963) and Gregory (1982) on laterality. Pre-adjustment and post-adjustment cases with 0.00 degrees laterality.

ADJUSTER	# CASES	PRE-ADJUSTMENT		POST-ADJUSTMENT	
		# CASES/PERCENT	# CASES/PERCENT	# CASES/PERCENT	# CASES/PERCENT
Gregory	108	0 / 0%		78 / 72%	
Grostic	523	0 / 0%		156 / 30%	

TABLE #6

A comparison of Grostic (1948-1950, 1963) and Gregory (1982) on laterality. Difference of pre-adjustment and post-adjustment means ($\Delta\bar{x}$); relative change of pre-adjustment and post-adjustment means $\frac{\Delta\bar{x}}{\bar{x} \text{ Pre}}$

ADJUSTER	$\Delta\bar{x}$	$\frac{\Delta\bar{x}}{\bar{x} \text{ Pre}}$	
		\bar{x}	Pre
Gregory	2.41°	.92	(92%)
Grostic	1.23°	.47	(47%)

TABLE #7

A comparison of Gregory (1958) and Gregory (1982) on laterality.

- % change in post-adjustment with 0.00° laterality = +71%
- % change in reduction of post-adjustment mean = +74%
- % change in reduction of post-adjustment std. dev. = +59%

TABLE #8

Pre-adjustment cumulative distribution. Gregory (1982) 108 cases. Absolute values of range limits.

ABSOLUTE VALUES OF RANGE LIMITS	# CASES	PERCENT
0.00	0	0
0.50	0	0
1.00	16	15
2.00	51	47
2.50	64	59
3.00	79	73
4.00	92	85
5.00	104	96
8.00	108	100

TABLE #9

Post-adjustment cumulative distribution. Gregory (1982). 108 cases. Absolute values of range limits.

ABSOLUTE VALUES OF RANGE LIMITS	# CASES	PERCENT
0.00	70	72
0.50	95	88
1.00	103	95
2.00	106	98
3.00	108	100

Discussion/Implications

The *Chiropractic Standards of Practice and Utilization Guidelines in the Care and Treatment of Injured Workers* (September 1988), a document that is the product of the Chiropractic Advisory Committee to the Department of Labor and Industries of the State of Washington, states (Appendix #3 p. 28).

“To perform frequent periodic plain film radiographic examination purely for biomechanical analysis to determine if changes are needed in manipulative procedures is seldom justified. The ability to determine minute differences in postural relationships, intersegmental alignment, etc., is related to projectional geometry, and there is considerable difficulty when comparing one set of film to another, since it is almost impossible to duplicate geometrical circumstances.”

The statistics in this paper clearly suggest that there are difficulties in the position of the Chiropractic Advisory Committee. The ability to determine minute differences in postural relationships, intersegmental alignment, etc., is related to projectional geometry but projectional geometry is only part of the story. The serious NUCCA practitioner addresses the greater part of these projectional geometry concerns by having properly aligned x-ray equipment and procedure to carefully and consistently position patients; these do much to insure that minute differences are both measurable and significant. As stated in *The NUCCA Basic Course: X-Ray Analysis* by R. R. Gregory (1986/page 10): “Accurate analysis of the CI Subluxation Complex demands exact x-ray alignment and precise patient placement for the x-ray.” What is not stated in the text is that patient position is more accurate for smaller subluxations than for larger subluxations.

As to the Chiropractic Advisory Committee’s statement that “there is considerable difficulty when comparing one set of films to another, since it is almost impossible to duplicate geometrical circumstances” was found to be of no merit in this investigation. In collecting the data this investigator noticed that in every case — more than a dozen — in which duplicate x-rays (same date, same view, and either both pre-adjustment or post-adjustment x-rays) existed, laterality markings were identical. Most of these cases were for pre-adjustment x-rays. All of these cases had to involve some degree of patient repositioning for the second x-ray. It should be noted here that because there was no ambiguity, i.e., whether the first x-ray was really the second, etc., this investigator did not have to discard any file. For the 1982

data, 108 consecutive cases were taken, without exception.

Most of the rest of the story is addressed by “anatomical” landmarks that are nearly invariant under properly aligned x-ray equipment and consistent positioning of patients. It is reassuring to see contributors to *Spine* choosing some of the same landmarks in their research.

This investigator can understand how accepting Sigler and Howe’s “Inter-and Intra-Examiner Reliability of the Upper Cervical X-Ray Marking System” (JMPT Vol. 8, No. 2, 1985) would lead the Chiropractic Advisory Committee to make such a statement. Certainly the last issue of *The Upper Cervical Monograph* (Vol. 4, No. 7, January, 1989) has exposed that article as seriously flawed; certainly research on upper cervical should use the best practitioners available — practitioners that are getting 85% or better reduction.

One of the charges against the Grostic and DeBoer study was that the adjusting chiropractor, J. F. Grostic, was not blinded to any part of the study and therefore would be expecting that kind of result. R. R. Gregory was not blinded to any part of this study either, but both Grostic and Gregory earned their reputation by their results. Among their peers at the time (1950’s) they were respected for their (1) adjusting ability, (2) professional integrity, (3) brilliance, and (4) recognized desire to improve their profession.

This study suggests that Gregory was getting better reductions than his contemporary, J. F. Grostic. In 1982 Gregory is seen to be getting significantly better reductions than either he or Grostic had been getting a score of years earlier. A paired T-Test indicates that the means of the pre- and post-adjustment laterality measurements to be ultra highly significant ($p < 0.0001$) (N = 108, Mean = -2.412, ST DEV = 1.139, SE MEAN = 0.110, T = 22.01, PValue = 0.0000). This is an order of magnitude more significant than in the Grostic and DeBoer study.

The laterality mean (2.63) of the Grostic and DeBoer study (523 cases) is statistically almost identical to the laterality mean (2.64) of this study (using the 108 consecutive cases). If these larger populations are truly representative, and if the 20 cases in the Sigler and Howe study are also representative, then the absolute (laterality) mean of Sigler and Howe (1.83) suggests that the participants in Sigler and Howe did have problems in measuring.

Conclusion

The significant difference between the pre-adjustment measured mean position of the atlas (laterality) compared to the post-adjustment measured mean may be, and most probably should be interpreted as a change in the position of the atlas. Both 1958 and 1982 data support this interpretation. What the 1982 data (108 cases) supports is the contention that the entire NUCCA system is a significant advancement over the “Grostic” system — directly in determining laterality using double-pivot point cephalometer, etc., and directly and indirectly in the “zeroing” of laterality. Therefore, future studies on upper cervical would be most appropriately done with participants (inter and intra examiner reliability studies) that are NUCCA Board Certified.

References

1. Sigler, D.C., Howe, J.W., Inter- and Intra-Examiner Reliability of the Upper Cervical X-Ray Marking System, JMPT, 1985, 8(2), 75-80.
2. Jackson, B.L. et al. Reply, Letters to the Editor, JMPT, 1988, 11(3) 229-230.
3. Jackson, B.L. et al. Inter- and Intra-Examiner Reliability of the Upper Cervical Marking System: A Second Look, JMPT, 1987, 10, 157-163.
4. Palmer, J.F. Debate and Protocol vs. Measurement and Openness, A Chiropractic Issue, The Upper Cervical Monograph, 1989, 4(7), 1-5.
5. Seemann, D.C., Letter to the Editor of JMPT, D. Lawrence, The Upper Cervical Monograph, 1989, 4(7), 5.
6. DeBoer, K.F., Letter to the Editor, JMPT, 1985, 8(4), 285-286.
7. Palmer, J.F., Letter to the Editor, JMPT, 1986, 8(4), 285.
8. Sansone, M. et al, Letter to the Editor, JMPT, 1986, 9(4), 285-286.
9. Grostic, J.D., DeBoer, K.F., Roentgeomographic Measurement of Atlas Laterality and Rotation: A Retrospective Pre- and Post-manipulation Study, JMPT, 1982 5(3), 63-71.
10. Gregory, R.R., *The Atlas Subluxation Complex Manual*, 1971, 1-24.
11. Gregory, R.R., *The NUCCA Bases Course: X-ray Analysis*, 1986, 1-40.
12. Gregory, R.R., *The NUCCA Advanced Course: Biomechanic*, 1987, 1-39.
13. Gregory, R.R., *Adjusting The Atlas Subluxation Complex*, 1988, 1-22.
14. Seemann, D.C., Observer Reliability and Objectivity Using Rotary Measurements on X-Rays, The Upper Cervical Monograph, 1986, 4(1) 1,6-8.
15. Gregory, R.R., The Double Pivot Point System, The Upper Cervical Monograph, 1981, 2(10),6-7.
16. Dickholtz, M., Magnification: How Much of a Problem in Spinographic Analysis, The Upper Cervical Monograph, 1983, 3(5) 1, 5-6.
17. Seemann, D.C., The Biomechanics and Neurological Aspects of the Atlas Subluxation Complex; The Upper Cervical Monograph, 1977, 2(2), 1-3.

NUCCA CERTIFICATION

A certification program has been initiated by the National Upper Cervical Chiropractic Association, Inc. (NUCCA). The purpose of the program is to NUCCA-qualify doctors in the NUCCA work. Doctors who successfully complete the program will be eligible to conduct and teach basic classes. A certification committee will be established from the initial group of doctors first certified. Examinations will be given at NUCCA seminars and conventions.

Doctors who wish to be NUCCA-certified must meet the following prior conditions: (1) be in practice for a period of at least three years, (2) have possession of, or access to, equipment and instrumentation recommended by NUCCA, and (3) permit NUCCA inspection of their office facilities. The entire examination must be completed in two years. Certificates will be issued successful candidates.

Doctors who have not engaged in practice for three years but who have attended NUCCA seminars are eligible to take the examination which covers a two-year period. A fee is charged each candidate. In the event of failure of the examination, or any part thereof, the candidate is re-examined in the part of the examination he failed without paying an additional fee, provided re-examination takes place within the two-year period.

Certification will be evaluated every three to five years, and certified doctors will be requested to either take an oral examination on updated data or provide evidence that they have attended a NUCCA seminar at least once each year.

The examination is in three segments, as follows:

1. X-RAY AND INSTRUMENTATION

- A. Understanding of x-ray alignment procedures
- B. Theory about distortion, magnification, collimation
- C. Produce ten sets of cervical films suitable for analysis
- D. Examination on x-ray procedures
- E. Submit a set of x-ray alignment films
- F. Examination on instrumentation

2. FILM ANALYSIS

- A. Knowledge of osseous structures
- B. Read ten sets of cervical spinal x-rays with an inter-observer reliability of .90
- C. Examination of film analysis

3. ADJUSTING

- A. Submit ten sets of consecutive pre and post cervical x-rays. The post x-rays presented to the examining board be those taken after the initial adjustment. Reductions in the height and rotation vectors to be evaluated at the discretion of the examining board.
- B. Oral examination in which the candidate is given various listings for which he is to explain reduction procedures.
- C. Written examination on adjusting. 100 questions with a passing grade of 85.

COMMENTS and CONCERNS RE X-RAY RADIATION (A Guide For Upper Cervical X-Ray)

By Marshall Dickholtz, Sr., D.C.

Radiation increases the likelihood of serious effects like cancers, leukemia and genetic damage due to ionizing radiation.

WHAT IS IONIZING RADIATION?

"Certain forms of electromagnetic radiation exhibit the ability to break bonds between atoms within molecules. The breaking of these atomic bonds is called ionization as it results in the formation of ions—an ion having an unequal number of protons and electrons. Consequently, radiation having the capability to cause ionization to occur is referred to as 'ionizing radiation.' The breaking of an atomic bond requires a significant amount of energy. Only those electromagnetic radiations with short wavelengths and high frequencies contain sufficient energy to break such bonds. The most common form of ionizing radiation is x-rays."¹

Hydrogen peroxide is also formed with free radicals at the same time as ionizing radiation is produced.

"Hydrogen peroxide, being a relatively stable compound, persists long enough to diffuse to points quite remote from their point of origin. Hydrogen peroxide, which is a very powerful oxidizing agent, can effect molecules or cells that did not suffer radiation damage directly."²

"Such damage may remain hidden for many generations. In the first generation and in any generation thereafter following parental irradiation, only a small fraction of the total changes eventually will become apparent."³

Maximum permissible dosage for radiation is 5 rads per year for radiation workers. This limit is set by the National Council on Radiation Protection. There are no limits set for your patients except that each exposure has a maximum allowable limit.

"As far as a cancer dosage is concerned, the brain is 22-26 times more sensitive than the eyes and 6-15 times more sensitive than the thyroid, females being the most sensitive."⁴

It behooves the doctors to use as little radiation as possible and to know how much radiation is given to each patient. If a patient asks this question, the doctor should have the answer.

Retakes can be kept to a minimum if all one's expertise is applied to each exposure for a quality film.

This article is written to enlighten the doctor to additional facts that he or she may not have obtained.

Cervical x-rays are considered a medium skin dosage.

Medicare requirement for x-rays are: "An x-ray will be considered to be reasonably proximate if it was taken no more than twelve months prior to, or three months following, the initiation of a course of chiropractic treatment."⁵

"In certain cases of chronic subluxation (e.g., scoliosis), an older x-ray may be accepted provided the beneficiary's health record indicates the condition has existed longer than 12 months and there are reasonable grounds for concluding that the condition is permanent."⁹

When and if the State inspects your equipment, you can get the exact radiation exposure for each fraction of a second or seconds if the agent wishes to take another few minutes of his time for this determination.

Otherwise, with some extrapolation, you will have an idea as to how much radiation there is in each of your exposures as you compare your equipment to mine as to MaS., KVP., film-screen speed, filtration at the tube head and whether you have a bucky with a moveable grid or as to what kind of stationary grid you may have.

The equipment that was used is as follows: Universal 125 KVP 300 Ma Full wave-Solid State—Rectified Machine with an Emerald 125 x-ray tube head with a .6 mm focal spot, 3.8 mm total equivalent aluminum filtration, timer \pm 2%, Smit Rontgen stationary grid—110 lines per inch, ten to one ratio, with fiber interspacing-aluminum cover—40 inch focal distance. Dupont-Rare Earth-Fast Detail Screens, Cronex 10 films. This is a 250 speed combination.

There is only a .032 of an inch sheet of plastic over the grid that has thin grooved lines about .020 deep, that divide the horizontal and vertical planes. White lead base paint was put into the grooved lines to show the vertical and horizontal plane on the x-ray film. A 1/16" sheet of lead in front of the back plate of the grid carrier for a scatter shield.

Equipment aligned as to the NUCCA x-ray Alignment Book.⁵

If equipment is not aligned, it can increase radiation considerably, along with distortion of the object.

My x-ray unit was fixed at the factory so I could use the small focal spot on the 150 Ma station.

Technique used 80 KVP 150 Ma 42" focal spot film distance Testing equipment was MDH Industries, Inc./Radcal Corp. Model 1015 x-ray Monitor MDH Industries, Inc./Radcal Corp. Model 10 x 5-6 Ion Chamber

	LATERAL	NASAL	VERTEX
Average Female	1/12 Sec. 20.4 mR	2/5 Sec. 80.6 mR	3/4 Sec. 181 mR
Average Male	1/10 Sec. 21.5 mR	1/2 Sec. 100 mR	1 Sec. 246 mR
	150 mR allowable	400 mR allowable	

The above times are increased because of attenuation of the x-ray field. By using lead filters of various thicknesses so that the x-ray field is attenuated other than the x-ray beam that hit the cervical spine on the nasal film and the atlas on the vertex film, radiation is reduced and a great deal of the scatter is eliminated. Otherwise, the scatter would darken the film and some of the detail would be lost.

The filters I use are thin layers of lead that have been designed on thin plastic slides. These are slid into rails in front of the culminator. The rails can accommodate 4 different slides at one time.

The plastic that is not covered with lead was cut out by a router.

On most nasal films, I use .006 thickness of lead that covers the area above the condyles.

Once in a while, I use .003 on a child or .009 on a high S line nasal.

This will not only protect a portion of the eyes and brain, but will let the parietal region to be seen better (not burnt out).

On the higher S lines for nasal films or big primary curves, you can add additional filters that cover their head and down to the 3rd or 4th cervical vertebra so the lower cervicals and first dorsal will show on the film. Of course, you will increase the time to overcome the attenuation of the x-rays in the upper areas and thus more radiation to the lower area for greater detail to the heavier part.

I use two different lead filters for this purpose.

One has .003 of an inch thickness of lead, the other has .006. Sometimes, I use both of them at one time when there is a high S line and/or a prominent primary curve of the spine.

My vertex filter center opening is only big enough to give an unattenuated field for the Atlas vertebra area.

That portion of the filter that projects the image of the nose has .006 of lead thickness and the rest of the filter has .009. There is also a frame of 1/16" of lead that covers the edges of the filter that will project a complete attenuation of the x-rays so that the edge of the film will be clear.

The tests gave the following information:

A preset of 3 films for females released 282 mR.

A preset of 3 films for males released 367 mR.

1 mR = .001 Rad

This is roughly 3/10 Rad for a female patient, 2/5 Rad for a male patient. With post-adjusted set of 2 x-rays, this would increase to 543 mR for a complete set for an average female and 713 mR for an average male.

If filters are used as to the areas that need not be fully exposed, radiation can be reduced up to 78% to the rest of the head and neck.

The charts show how much radiation can be cut down by using lead filters above the condyles on the nasal film or around the Atlas on the vertex film:

80 KVP 100 MaS 42" focal spot film distance

Unattenuated	.003	.005	.006	.009	.010
½ Sec. 87.4 mR	34.5 mR	20.3 mR	18.7 mR	10.2 mR	7.7 mR
1 Sec. 175 mR	68.6 mR	39.7 mR	38.3 mR	20.1 mR	14.2 mR

The above thicknesses were tested because .003 + .005 thicknesses of lead can be found and by using their multiples, you can get any amount of attenuation you need or want. Different thicknesses of lead foil can be put on several filters and used as the patient's head and neck requires.

There is also thin lead foil on the back of dental films. These pieces can be pieced and layered together and used to make filters.

The following chart shows the attenuation of radiation using aluminum:

80 KVP 100 Ma 42 inch focal spot film distance

	Unattenuated	1 mm Al.	2 mm Al.	3 mm Al.
½ Sec.	87.4 mR	68.4 mR	51.8 mR	43.1 mR
1 Sec.	175 mR	137 mR	103 mR	86.8 mR

For every 1 mm of aluminum added for filtration, it reduces radiation about 20% more than the previous level.

To get the equivalent of .006 lead foil, you would have to use 6-7 mm of Aluminum.

To sum up the above, if you want to cut radiation to the patient use a stationary grid that has fiber interspacing and a carbon fiber covering.

I have just checked an 8:1 ratio grid, 110 lines per inch, that I compared to my 10:1 grid. The film quality is practically indiscernable with 19% less radiation. Now with grids that have 150 lines per inch an 8:1 compared to a 10:1, there is a difference of 22% in radiation.

I recommend the 150 lines per inch 8:1 ratio 40 inch focal distance. Smit Rontgen will make them to order.

Another factor that I bring to your attention is on automatic processors, that if your developing temperature is off one degree, you will lose 7% in radiograph density. Use a long-stem thermometer that can be left in your developing tank (not a digital).⁶

There are charts that are available from the film companies that will take into account the type of developer you are using with the time it takes the film to go through the developer of the film processor that will tell you at what temperature the developer tank should be set.

"Since milliamperage is so much a function of tube capacity it is quite impractical to use it as a variable.

It is good technique to keep three factors constant and vary only the fourth to effect changes in radiographic density (MaS)

Time can be used as a variable with excellent results except where motion is a factor."¹⁰

Other than children and osteoporotic patients keep the KVP and Ma the same and change the time.

To avoid retakes, a chart can be set up as to what time you will use, also depending upon the angle that you will be taking the nasal film. There can be a range of time in some squares.

Different S Lines may require certain filters.

These can also be listed in each square.

When taking vertex films, NUCCA's chin centering device should be used. This will reduce retakes because of better patient placement and give the doctor better comparisons between the pre and post x-rays.

Processors should be cleaned and chemicals changed every 30 days with the proper safe light for the film you are using and a darkroom that has no light leaks.

Weather stripping can be used around the door if there are leaks.

The tube should be mounted in a vertical position so the heel effect of the x-ray tube is pointed down.

This is where the cathode is below the anode.

SMALL MEDIUM LARGE

Lateral	F			
	M			
Vertex	F			
	M			
S ⁰ Tip of the nose	F			
	M			
S ¹ — S ²	F			
	M			
S ³ Bottom of ocular orbit	F			
	M			
S ⁴ Middle of the eye	F			
	M			
S ⁵ Top of ocular orbit	F			
	M			

The less radiation that the patient is exposed to, the less harm, the less scatter, the better the detail.

“Keeping the above in mind, let us consider that a bucky with a moveable grid takes more radiation to expose and film than a stationary grid. “The lateral decentering may result in a loss of as much as 20% of the primary radiation with a high-ratio grid and a short focusing distance. The second cause of increased patient exposure are the photons that are spread out uniformly on the film by a moving grid. With the identical number of photons per unit area, a film is 15% darker with a stationary grid because the photons are concentrated between the lead strips.”⁸

Now there are different kinds of stationary grid, (besides considering the ratios and the number of lines to the inch.)

There is about 16% (@80 KVP) more radiation necessary to go through the aluminum interspacing than fiber interspacing.⁷

Then there is the aluminum coverings of the grid or carbon fiber coverings. The aluminum coverings would need about 8% more radiation than the carbon fiber covered.⁷

On the patient’s record card, mark the filters used, KVP, Ma and time you used to take the different views and change them anytime you can improve the quality of the film. Sometimes, the glabella is not in the center of the head and you might have rotation of the patient’s head on the film, so mark the card to turn the head, right or left of the center alignment rod, and how much.

Not forgetting that the arch of the Atlas should be only slightly elevated on the nasal film, so adjust the S line on the card, if necessary.

Everytime you look at a film, you should ask yourself, “Is there anything I can change to make a better film” and then mark the card.

It will save a lot of retakes, which is radiation to the patients, time in taking the films, the cost of processing of the films with the wear on the x-ray tube.

This author hopes the above information will be of help to chiropractic patients and the chiropractor.

The addition of yttrium filter will further cut down radiation to the patient.

“It is equivalent to using 2.65 mm of aluminum.”¹¹

- 1-3 I D N S Publication
Topics in Radiological Health
The Underage Radiation Worker
- 2 Introduction to Health Physics Chapter 7
Biological effects of Radiation
- 4 Radiation and Human Health by
John W. Gofman, MD.
- 5 N.U.C.C.A. X-ray Alignment Booklet by
Dr. Marshall Dickholtz, Sr.
- 6 Helpful Hints for Radiology Vol II July 1988
Du Pont Company by John Mussar
- 7 Smit Rontgen The Netherlands Bulletin
- 8 Christensen’s Introduction to the Physics of
Diagnostic Radiology Third Edition
- 9 Blue Cross/Blue Shield of Illinois Medicare Part B
May 1987
- 10 Formulating X-ray Techniques Eighth Edition
John B. Cahoon
- 11 Wendell M. Hickman, M.S., Nuclear Safety Inspector
Illinois Department of Nuclear Safety

Notice

Five patient education pamphlets are now available from NUCCA. The cost is \$27.00 per hundred which includes postage and handling. All pamphlets must be paid in advance due to our non-profit status.

1. *A Patient Guide*, (yellow), explains step-by-step office procedure to new patients.

2. *Questions and Answers*, (yellow), answers questions most frequently asked.

3. *A Patient Guide*, (green), explains what every patient should know.

4. *The Adjustment and the Patient*, (blue), explains the adjustment and how it works.

5. *The NUCCA System of Chiropractic*, (white), for patients, doctors, and students, explaining the NUCCA system.

Three new booklets have been published by NUCCA. The first booklet details the NUCCA x-ray analysis procedure: *The NUCCA Basic Course: X-ray Analysis*; the second booklet, *The NUCCA Advanced Course: Biomechanics*, explains the biomechanics of The Atlas Subluxation Complex, and the third booklet, *The NUCCA Course: Adjusting The Atlas Subluxation Complex* details the phases and steps of the C1 adjustment and explains *The Standing Positions*, a glossary of terms is included.

Each booklet sells for \$15.00.

Traditional Chiropractic

By Ralph R. Gregory, D.C.

The traditional practice of chiropractic is the correction or restoration of vertebral displacements so that a normal neurological impulse flow can be re-established throughout the body. Many concepts foreign to this basic restoration principle have entered into the practice of chiropractic under the name of chiropractic until today the practice is far removed from the aims and goals of the founder of chiropractic, Daniel David Palmer, and his son, B. J. Palmer, the developer.

Is the practice of chiropractic the restoration of vertebral displacements or simply the application of some undirected force to the spinal column—a force having no predetermined or calculated destination for a suspected vertebral segment? Which was the intent of the Palmers?

In his book, *The Science, Art, and Philosophy of Chiropractic*, D. D. Palmer comments on manipulation of the spine and states: "I do not manipulate any portion of it."¹ On page 42 of the same book, Palmer says: "Remember, adjustments are only made when a vertebra is returned to its normal position."²

B. J. Palmer, D. D. Palmer's son, wrote in reference to the displacements of articular joints and their causes: "No matter how they are displaced, the chiropractor sees fit to replace them in their normal positions."³

These quotes are not intended as an argumentum ad verecundiam—an appeal to authority. The Palmers, however, were first in chiropractic, the discoverer and the developer. Their statements disclose their thinking and is supportive of the restorative principle behind chiropractic. They were fully aware, as their writings show, of other spinal therapy systems, and they drew the exact line wherein chiropractic differed: The restoration of the vertebral displacements of the subluxation. They must have known that their system, chiropractic, had to have a different name and a unique system of practice to be eventually legally recognized, and not be merely a repeat of former systems that had been known and practiced for years before 1895.

Chiropractors themselves should realize the danger to the profession in permitting the term "manipulation" to stand for the term "adjustment." The practice of adjusting, or vertebral displacement restoration, not only distinguishes, separates, and identifies chiropractic as a separate system from all other spinal therapies but protects chiropractic from invasion by other therapies. If chiropractors invade other health fields, they cannot be heard to complain if others invade chiropractic.

Numerous reasons are apparent in the writer's opinion why vertebral restorations are not being accomplished in the practice of chiropractic. Today, some reasons are to be found in the teaching of chiropractic in our colleges, the greater skills required in adjusting the upper cervical spine, the adoption of cast-off osteopathic techniques, statements frequently made by some chiropractic authorities that it is not essential or possible to replace displaced vertebrae, too

little background training in the physical sciences, and a lack of adequate research of the vertebral subluxation and its effects on the body. A lack of communication between chiropractic researchers may be added to the above list.

One might also ask: Is there a feeling of inadequacy among practitioners due to the widespread comments from so called authorities re the restoration of displaced vertebrae that prevent many from attempting the practice of a system that does restore vertebral displacements?

The National Upper Cervical Chiropractic Research Association, Inc. (NUCCRA) has since 1971 constantly engaged in researching the C1 subluxation and its measurable effects on the human body. Much that has been previously accepted on a theoretical basis, on faith, has been empirically tested. Some has been proved, some disproved, and many concepts are in the process of being tested. The tested NUCCRA findings are open to any fair minded chiropractic researcher who wishes to investigate.

NUCCA has received much criticism from researchers who cannot or have not demonstrated their ability to practice the NUCCA system. This criticism, however, has been a help as the input has proved an insight into the thinking of the critics. Criticism, therefore, is weighed carefully and becomes of value in the NUCCRA testing procedures. On its Research Board, NUCCRA has two University Professors, Daniel C. Seemann, Ph.D., and James F. Palmer, M.S., both of whom are experienced and qualified in research. Under the guidance of Seemann and Palmer, NUCCRA research has been confined 100% to the C1 subluxation and its measurable effects. Over the years, a considerable body of knowledge has been accumulated. The contents of this article are based on this knowledge. More tested data exists re the C1 subluxation and its effects than is now realized throughout the profession.

The chiropractor who is skilled in all phases of the C1 subluxation complex can predict the biomechanical outcome of the displacement correction. If he or she achieves a 95% correction prediction, all of the procedures are regarded by the scientific community as scientific. This is their standard. It is also one of the reasons for the post x-ray; another reason is patient protection. It is also a fact for NUCCA's critics to consider who find fault with the taking of films and the line-drawing analytical methods NUCCA uses. If the chiropractor's prediction achieves the 95% standard, all the NUCCA procedures he or she has utilized have to be correctly done, including the adjustment.

Clinical studies of the C1 subluxation are based on four factors: observation, description, measurement, and prediction. These factors are an aid in building the acceptable scientific system. Clinical testing based on the relief of symptoms rather than on the biomechanics of the subluxation is erroneous reasoning because symptoms are subjective, and cannot be measured in the chiropractor's office.

Description is definition, it is the act of making something definite or clear as to its properties. An acceptable description requires the inclusion of all the details and the meaning of the behavior of the thing being described.

Measurement (in chiropractic) is of the displacement

factors of the vertebral subluxation by x-ray analysis and of the distortion effects of the subluxation on the patient's body; the contracted leg, pelvic imbalance, and deviation of the spine from its normal position. These effects are always present when C1 is subluxated because of the neurological over-innervation caused by the C1 subluxation imbalancing the inhibitory—facilitatory balance between these mechanisms in the brain stem.

Predictability defined is the ability to forecast the results of an action, to make known ahead of an act what its outcome will be. In NUCCA practices, predictability is the forecasting of the biomechanical results of all the procedures on a patient from taking the original x-rays through the analysis and the adjustment. If these procedures are accurately executed and the prediction standard of 95% attained, it strongly indicates a scientific procedure in all phases.

Clinical testing of the accuracy of the NUCCA procedures essential to achieve the prediction standard have been followed in NUCCA for several years on thousand of cases. Verification has been by immediate post x-ray following the first adjustment and by post-checks on the subluxation's measurable bodily effects. Throughout, the C1 subluxation has been observed, described, measured in all its aspects, and predicted. This procedure permits the practitioner to know exactly what he is doing for and to his patient.

The function of Physics is to explain **why** things happen. Physics is the basic physical science. It is subject to experimental investigation and to theoretical inquiry and its goal is the formulation of comprehensive principles, or laws. In one sense, all of Physics may be regarded as mechanics, and many of these mechanical principles lie behind the practice of orthodox chiropractic and should be utilized by the chiropractor.

Kinematics, for example, is concerned with the description of the motion of an object. Dynamics treats of the object's motion and the forces that act on the object. Statics concerns systems of objects in equilibrium. These are all chiropractic concerns.

Traditional chiropractic as is NUCCA is based on mechanics, and subject to the principles that apply. As chiropractors we are dealing with the motion of bodies, the displacements of vertebrae, the skull, and the pelvis. We describe this motion when we analyze x-rays, and we measure their displacements. We observe the forces that cause the motions within the subluxation in accordance with mechanical principles and we introduce controlled and calculated force (adjustment) to restore the displaced vertebrae by introducing motion to these vertebral segments. If this were not true, chiropractors would use some other form of energy than mechanical to move vertebral displacements.

Physics teaches that displacement of an object is simply its distance and direction from some starting point or origin of coordinates. A displaced vertebra obeys the same principle. The spinal column is the body's gravital line and the supporting structure of the body. When it deviates from its normal position, it is subject to gravitational stress—forces that tend to displace and to subluxate one or more of its

segments. It is in normal position, or properly aligned, when the spinal structures and skull's axes of motion lie on the "Z" coordinate of the orientation planes. Displaced vertebrae, capable of causing neurological involvement, or subluxation, are those that are displaced from the "Z" coordinate, or vertical axis (distance) into one or all of the three planes of motion: sagittal, frontal, and transverse (direction).

A subluxed vertebra, therefore, is a displaced vertebra with the characteristics of distance and direction—the cause of neurological insult. Its correction must observe the principle of direction and distance from the "Z" coordinate, i.e., correction is the reversal of the direction at the exact distance of abnormal displacement. This is the reason for vectors.

Physics further teaches that displacement is the most basic of vectors. Vectors, or vector quantities, must be specified by both size and direction in space, i.e., any force properly described requires that its size and its direction be included. The corrective adjustment necessitates the computation of vectors and the final resultant of the applied forces to restore the distance of the subluxated vertebrae along the exact line of direction to its normal position on the "Z" coordinate or vertical axis of the body.

Broadly speaking, a vector is any force or influence. A displacement is referred to as a vector when its size and direction of distance are combined. The distances of the subluxated vertebrae from their normal positions on the vertical axis produces the nasium vector; the vertebra's rotation direction and distance into the transverse plane produces the rotation vector. The two vectors, computed, establish the resultant, or single force which gives the final distance and direction along which the adjustive force must travel to restore a given C1 subluxation. Vectors are, therefore, an integral part of the x-ray analysis. Misdirected adjustive forces applied to the subluxation fail to restore C1 complex subluxated vertebrae to or toward the vertical axis because they disregard direction and distance. Such misdirected forces do violence to a subluxated vertebra and to the principle that vertebral displacements cause neurological insult, because they can increase the vertebral displacements, thus causing greater neurological detriment. What sense does it make to increase the displacements, thereby causing further detriment to the central nervous system?

The question has been frequently asked: Do chiropractors treat symptoms or restore subluxated vertebrae? Perhaps the question should be rephrased: Do chiropractors treat symptoms by first restoring biomechanical integrity to the spinal column? The answer for the orthodox practitioner is biomechanical integrity first; symptoms follow as a consequence of the accuracy of the procedure.

The recent ICA vote on merger with the ACA disclosed that thousands of chiropractors still favor orthodox chiropractic—the restoration of the vertebral subluxation. This number might well have been greatly increased if chiropractic practice had developed upon the known, relevant, and tested principles of the physical sciences rather than on the theoretical basis it pursued.

If the concept is sound that a displaced vertebrae causes neurological detriment, it is logical that these displacements must be restored, not simply changed in position. Spinal segments articulate normally only when they align to the vertical axis of the body. This is the position where they are architecturally designed to articulate normally. The question might be asked: If displaced vertebrae are not to be realigned by the adjustive force, why are they structured so that their juxtaposition requires alignment in order to function normally? The application of a misdirected force to a spinal segment is to destroy the efficacy of chiropractic. In fact, it is not chiropractic. NUCCA statistics show that at least a 80-90% restoration must be obtained to alleviate the patient's symptoms effectively.

Much has been said and written, medically and chiropractically, about the chiropractor's inability to restore displaced vertebrae. If this is true, we should drop the term "adjustment" which means "to restore," for a more descriptive term like "maladjustment." Chiropractic literature speaks of correcting subluxations. What does this term "correcting" mean if displacement factors—the causes of the subluxation—are not restored?

If a displaced vertebra is distanced from its normal position, or origin of coordinates, it should be observed, described, and measured in all planes of motion, determine where its normal position should be, and specific vectors established that will restore it to normal. There is simply no rationale for not doing so.

Those who state publicly that displaced vertebrae cannot be restored by an adjustive force to their normal positions, or state that the evidence is weak that they can be restored, should examine the NUCCA evidence or at least present their evidence in support of their statements.

One thing that is obvious to those who have researched the subluxation complex and its bodily effects is that measurements of the bodily effects vary as changes take place following adjustments in the subluxation complex, indicating the correlation between the displacement degrees of the subluxation and its effects. This supports the hypothesis that the degree of subluxation restoration determines the degree of its effects on the body. As this testing is found to be consistently true, the conclusion is supported that a C1 subluxation complex detrimentally affects all levels of the nervous system.

Daniel C. Seemann, Ph.D., sums it all up in his article in Volume 4, Number 6 of the *UPPER CERVICAL MONOGRAPH*. He writes: "----there is a dilemma in chiropractic because a wide gap exists over how to reduce a subluxation. The solutions range from the emotional to the rational and less seldom to the scientific. Those with an emotional point of view are usually quite defensive and attack other systems not really knowing much about the other system. Or a group will not understand a particular procedure and will then deny that it is possible to use the procedure. Many in chiropractic who still call themselves chiropractors have fled to quasi-medical procedures because they see nothing in chiropractic that is scientific. The writer feels that many have fled pure chiropractic because of the heavy reliance on

a philosophical agenda instead of a scientific agenda. Until chiropractic can get on a scientific base there will always be a disagreement on how to reduce the subluxation".

REFERENCES:

1. Palmer, D.D., *THE SCIENCE, ART AND PHILOSOPHY of CHIROPRACTIC*, Pg. 14, 1910, Portland Publishing House, Portland Oregon.
2. Palmer, D.D., *Ibid*, Pg. 42.
3. Palmer, B.J., *SCIENCE of CHIROPRACTIC*, Vol. 1, Pg. 33, 1920, Palmer School of Chiropractic, Davenport, Iowa.

The 1989 Fall Seminar

The 1989 NUCCA Fall Seminar will be held at St. Mary's Conference Center, 502 West Elm Avenue, Monroe, Michigan 48161. Attendance at the seminars has outgrown the conference room at Howard Johnson's, now Days Inn.

The seminar starts on Saturday, October 28th, 1989, at 8:00 a.m. and ends on Tuesday, at 5:00 p.m., October 31st.

The educational program will be supervised by Dr. Daniel C. Seemann, University of Toledo and NUCCA Executive Director. Coordinating the work will be Mr. James F. Palmer, M.S., also from the University of Toledo and research consultant to NUCCA-NUCCRA.

Instructors will be Drs. K. E. Denton, Glenn Cripe, Lloyd Pond, Lonnie Pond, M. Dickholtz, A. A. Berti, T. Palmer, L. Schrock, E. Stein, and R. R. Gregory.

Subjects will be film analysis, basic and advanced, anatometer exercises, leg checking exercises, headpiece placement, biomechanics, adjusting exercises, patient placement for adjusting and x-ray, and x-ray alignment.

Fees for professionals are \$400.00, for Doctors in practice two years or less, \$250.00. Students are admitted for \$150.00. A deposit of \$50.00 must accompany each application form. (Application forms are included in this issue of *The Monograph*). **Deposits are not refundable.** All monies above expenses will be used for research.

The deadline for accepting applicants to the 1989 Fall Seminar is September 10, 1989. Several applicants had to be refused at the previous seminar for not meeting the deadline.

Motels to contact for rooms are: Holiday Inn, 1225 N. Dixie, Monroe 313-242-6000; Days Inn (formerly H. J. Motel), 1440 N. Dixie, Monroe, 313-289-4000; Knights Inn, 9250 N. Dixie, Monroe, 313-243-0597.

Further information may be obtained by contacting NUCCA, 217 West Second Street, Monroe, Michigan 48161. Phone: 313-241-6923.



Dr. Donald P. Kern Addresses The NUCCA Convention

Doctors and students attending the 1989 NUCCA Convention and Educational Conference were pleasantly surprised on Saturday, May 6th; by hearing a lecture by Dr. Donald P. Kern, President of the Palmer College of Chiropractic, Davenport, Iowa. Dr. Kern's lecture re the future of chiropractic and the Palmer College was enthusiastically received.

Dr. Kern was accompanied to the NUCCA Convention by Mrs. Kern and Ms. Vicki Palmer who were also enthusiastically received. NUCCA was honored to have these distinguished guests.

NOTICE

The fees set by the NUCCA Board of Directors for applicants taking the Certification Tests are as follows:

- 1st Segment - \$ 50.00
- 2nd Segment - \$100.00
- 3rd Segment - \$100.00

Fees are payable prior to taking each segment. Applicants should make checks payable to NUCCA, Inc.

Application Form For The 1989 NUCCA Fall Seminar

(use this form when applying for admission)

The 1989 NUCCA Fall Seminar will be held starting Saturday, October 28th at 8:00 a.m. through Tuesday, October 31st, 1989, at 5:00 p.m. at St. Mary's Conference Center, 502 West Elm Avenue, Monroe.

Professional fees are \$400.00; Doctors in practice two years or less, \$250.00; Students, \$150.00

The deadline is September 10, 1989. Register now. We do not wish to refuse late registrants as in the past.

Professional services will be offered on Thursday, October 26th and Friday, October 27th. All pre x-rays must be on Thursday. The fee for professional services is \$120.00 and must accompany this registration form. **This service is limited to no more than twelve.**

Consult the **1989 NUCCA Fall Seminar** article in this Monograph for further information.

Fill out the application form below in full, and return it by September 10, 1989 (deadline). Include fee deposit of \$50.00. Include professional service if desired, of \$120.00, made out to Dr. Ralph R. Gregory.

1989 Application Form

Name _____

Address _____ Zip _____

Will you require certification for license-renewal?
Yes _____ No _____

Do you request professional services? Yes _____ No _____

Have you made Hotel Reservations?
Yes _____ No _____ Where _____

Deposit fees are not refundable.

Please print or type. Signed _____

MONOGRAPH Subscription Blank

I, the undersigned, wish to subscribe for one year to the MONOGRAPH and herewith enclose the ten (\$10.00) dollars subscription fee. Send me the MONOGRAPH at the following address:

Name _____

Address _____

City _____ State _____ Zip _____

I am actively engaged in practice. Yes No

I am a member of the following organizations:

I.C.A. _____ A.C.A. _____ Other _____

I am a student at _____

S/S _____

(PLEASE PRINT OR TYPE FORM)



The 1989 NUCCA Convention and Educational Conference

The 1989 NUCCA Convention and Educational Conference was held at the Howard Johnson Motor Lodge, Monroe, Michigan. Starting on Saturday, May 6th, it concluded on Tuesday, May 9th. It was the largest Convention Conference in NUCCA's twenty-three history.

The Educational Conference was opened and supervised by Dr. D. C. Seemann, NUCCA Executive Director and University of Toledo Professor. Coordinating the program was James F. Palmer, M. S., also a Professor at the University of Toledo and research consultant to NUCCA.

Instructors were Drs. K. E. Denton, A. A. Berti, M. Dickholtz, Sr., T. A. Palmer, Lloyd Pond, Lonnie Pond, Ed Stein, L. Schrock, and R. R. Gregory.

Subjects presented were basic and advanced film analysis, anatometer exercises, biomechanics, problems and solutions, research findings, leg-check exercises, patient placement on x-ray equipment and on adjusting tables, and adjusting technique. Doctors were given a choice in choosing subjects they wished to pursue. Each station had certified instructors.

Students from several colleges attended as did doctors from throughout the United States and Canada. Australia was represented by Dr. Peter Esdaile.

A banquet was hosted by NUCCA on Sunday evening, May 7th. Dr. R. Gregory was honored for his 50 years of service to chiropractic.

Mrs. K. E. Denton was presented with a bouquet of roses from NUCCA in appreciation for planning the banquet.



Notice of Price Increase

Due to increased cost of production and increases in postal charges, the educational pamphlets sold by N.U.C.C.A. will be increased from \$20.00 per 100 to \$27.00 per 100. If pamphlets are purchased at a seminar, the cost will be \$25.00 per 100.

N.U.C.C.A.'s status as a non-profit organization requires that pre payment on all items must be received before shipping can occur.

The Upper Cervical
MONOGRAPH
Published by
THE NATIONAL UPPER CERVICAL
CHIROPRACTIC ASSOCIATION, INC.

EDITOR:
Dr. Ralph R. Gregory
221 West Second Street
Monroe, Michigan 48161

The Ruth O. Gregory Memorial Fund

The National Upper Cervical Chiropractic Research Association, Inc. (NUCCRA) again extends its thanks to the many and generous donators to the Ruth O. Gregory Memorial Fund. Donations recently received are helping to finance the continuous reach of NUCCRA as it attempts to build a body of tested knowledge of the subluxation complex, advance the profession along scientific lines, provide better service to chiropractic patients, and help the chiropractor in his practice.

The NUCCRA Directive Board in November of 1982 unanimously voted to establish a memorial fund as a tribute to Ruth O. Gregory in appreciation for the time, money, and effort which she so unselfishly gave to the NUCCA-NUCCRA Organizations. This fund is to exist as long as the organizations exist. It was her great desire that chiropractic become more scientific and of greater benefit to mankind, and she realized that bonafide research was the way to achieve these goals.

Since her untimely death in 1982, Doctors, students, and lay persons have donated to the NUCCA-NUCCRA Organizations to further the research and the advancement of chiropractic for the benefit of all concerned.

Recent contributors to the Ruth O. Gregory Memorial Fund are:

Dr. Jean-Paul Martinet	California
Dr. D. C. Seemann	Ohio
Dr. M. Dickholtz, Sr.	Illinois
Dr. M. Madden	Texas
Judge & Mrs. Wm. Weipert, Jr.	Michigan
S. H. Cowell Foundation	California
Dr. Steve Duff, Jr.	California
Dr. G. P. Foran	Vancouver, B. C., Canada
Dr. J. Cirigliano	California
Ms. Wendy Galor	Connecticut
Dr. L. Vinson	Alabama
Dr. I. Adamczuk	New York
Mrs. Marynelle Shields	Indiana
Dr. L. Yardley	Washington
Dr. B. O'Brien	Hawaii
Dr. S. MacDonald	California
Dr. Gene Lusk	Texas
Dr. S. Dickholtz	Illinois
Dr. P. Esdaile	Australia
Dr. B. T. Stewart	Alabama
Dr. G. E. Martin	Arizona
Dr. A. Latanishen	Pennsylvania
Dr. S. Goodman	Pennsylvania
Dr. B. Hirschhorn	Pennsylvania
Dr. L. Hunger	New York
Dr. R. R. Gregory	Michigan



Left to right: Dr. K. E. Denton, Mrs. K. E. Denton, Dr. R. R. Gregory, Mrs. A. A. Berti, Dr. A. A. Berti.



Shot of banquet room and some NUCCA guests.



Mrs. K. E. Denton receives bouquet of roses in appreciation for arranging and planning banquet. Presented by Dr. E. Stein for NUCCA.

NOTICE

The NUCCA Board of Directors has decided to make the NUCCA collection of video tapes available to members. The price for tapes has been set at \$100.00 per classroom hour. Available titles include:

Osseous Structure Identification (45 min.) \$ 90.00

This tape depicts the various bony structures involved in the NUCCA x-ray analysis. Included are structures that present analytical problems. X-rays of live and dry specimens are used.

NUCCA X-ray Analysis (60 min.) \$100.00

Step by step procedure of the NUCCA analysis using X-rays of live specimen.

Leg Check and Headpiece

Placement (45 min.) \$ 90.00

Leg Check describes the planes of reference and how to align the examiner's body for accurate checking. Models and patient used. Errors are discussed. *Headpiece Placement* briefly describes the biomechanics of the correction of the four basic types. Center of Gravity of the skull and its placement on the three types of headpieces is shown.

Adjusting the A.S.C. (3½ hrs.) \$300.00

Step by step procedures used to align the adjustor's body in addressing the various A.S.C.s. Includes the most common errors in each phase. Outline of video follows early *Monographs*, Vol. 1 No. 3 through Vol. 2 No. 4. Film includes various steps for posterior rotations and low vector listings.

Errors in Adjusting the A.S.C. (2 hrs.) \$200.00

Compliments *Adjusting the A.S.C.* This tape describes errors in adjusting, what causes them, and how to correct them.

Patient Placement For X-ray (45-min.) \$ 90.00

Precision placement of the patient for the lateral, vertex, and nasium views are discussed.

X-ray Alignment (45 min.) \$ 90.00

Step by step procedure used to align cervical x-ray equipment to N.U.C.C.A. standards. To be used with the N.U.C.C.A. X-ray Alignment booklet.

Biomechanics of The Four

Basic Types (1 hr.) \$100.00

Detailed discussion of the production and correction of The Four Basic Types of A.S.C.S. Headpiece placement and lever system shown in detail.

Questions and Answers, A Self Evaluation For Adjusting The A.S.C. (1 hr.) \$100.00

Follows Monograph Vol. 3, No. 9 and No. 10. A chronological order as a guide for the adjustor when practicing the C-1 or triceps pull adjustment. By self-questioning, based on this tape, the adjustor is alerted to the adjusting steps he/she may have neglected or does not know, and the order in which the steps should be performed.

High quality video tapes have been used for reproduction, which carry a lifetime guarantee. Please specify BETA or VHS. Allow 4-6 weeks for delivery. Prices are subject to change with cost of reproduction.

THE NATIONAL UPPER CERVICAL
CHIROPRACTIC ASSOCIATION, INC.

221 West Second Street
Monroe, Michigan 48161