

**COLLECTED
PAPERS OF THE MEMBERS
OF THE
INTERNATIONAL COLLEGE OF APPLIED KINESIOLOGY-U.S.A.**

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MESSAGE FROM THE CHAIRMAN

The International College of Applied Kinesiology-USA continues to flourish as a forum in which doctors in the healing professions can present their ideas and their research. By contributing to the collected papers, members have the opportunity to be heard and to be guided in their further efforts through the feedback of their colleagues.

The collected papers include a compilation of research reports, validation studies, case reports and intellectual discourses on various aspects of Applied Kinesiology. Some of the papers represent "seeds" which will grow into powerful diagnostic and therapeutic procedures.

The members of the International College of Applied Kinesiology-USA are to be congratulated, not only for contributing to this collection of papers, but for receiving them, studying them and assisting their authors in the further development of their ideas, concepts and procedures. Through the synergistic effects of helping ourselves and each other to grow, we become a more powerful team, and our contribution to the healing arts and to the health of the world's people multiplies in an exponential manner.

Robert M. Blaich, D.C.
Diplomate
Chairman, ICAK-USA

*Diplomate

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THE NEED FOR IMPROVEMENT OF CONTINUING PROFESSIONAL EDUCATION IN CHIROPRACTIC

By: Arlene Davis Beck, B.A., M.A., M.S.W., & Paul T. Sprieser, B.S., D.C.

Abstract: A marketing research study conducted to see what areas of Continuing Professional Educational the chiropractic profession was interested in. An methods to improve the teaching of these materials.

After practicing chiropractic for 19 years and taking at least 100 hours of Continuing Professional Education a year, and having taught Applied Kinesiology, Temporomandibular Joint Dysfunction, Nutritional and Acupuncture courses for the past five years I felt there could be methods of more effective pedagogy as a student and as an instructor, I was not sure what the chiropractic profession was really interested in today.

So I decided to commission a marketing research study to see what the Chiropractic profession in the tri-state region was interested in learning, and how they preferred to learn.

The marketing research was conducted by Davis Beck Associates. The president of this firm, Arlene Davis Beck is a teacher at NYU's, Graduate School of Entrepreneurial studies. She has also taught at Kean College to outstanding student evaluations of her teaching techniques and handling of the material to be covered.

The study was conducted of a small sampling of 200 chiropractors in the tri state region (NY,NJ, PA). The group was broken up into 100 who had studied with me (biased group) and 100 who were picked at random (random group). None of the chiropractors contacted knew who was connected with this study.

The number of returns were overwhelming since the average marketing research study, would expect about an eight percent return per hundred. To date 46 questionnaires have been returned and still some are coming in. The questionnaire were sent out between 2/23 and 2/28/87. The following questionnaire was sent out with stamped, self addressed envelopes going to Davis Beck Associates.

DAVIS BECK ASSOCIATES**"We Make Sales Go Up"**

February 23, 1987

**33 Treaty Road
Randolph, NJ 07869
201-361-3305**

Dear Chiropractic Physician:

We are researching the needs chiropractors perceive as important to their Continuing Professional Education. Please take a minute to fill out this form and return it in the stamped, self-addressed envelope. If you wish to sign it please do; or, if you prefer, do not sign your name just return the completed form. If you would like a copy of the final Market Research study just request one and add your name and the address you want it mailed to.

1. In the last 3 years what Continuing Professional Education courses, lectures or seminars have you attended? Title and/or subjects.

2. Which areas do you want more Professional Education in? Check or circle the areas important to you and add any others you wish.

Technique	New Research
Theory	Eastern Healing Techniques/Philosophy
Vitamin/Mineral Supplements	Avant-garde Healing Arts
Pain Handling	Patient/D.C. Communication Skills
Nutrition	Exercise
Marketing Your Practice	Office Procedures
Practice Economics	Computerization of your office.

3. What do you look for in Continuing Education?

What materials do you want to take with you from a seminar/course?

How do you learn best - reading/lecture/tapes/hands on?

4. How do you rate the Continuing Professional Education you have participated in within the last 3 years. Excellent, good, average, poor, unacceptable. Which ones get which rating and why?

5. What state do you practice in?

How many years have you been in practice?

Thank you for your cooperation and time. This material will probably become part of an article on Professional Education to be published in the near future.

Yours truly,

Arlene Beck
Arlene Beck
President

Please add any additional comments you have or wish to share with us.

ADB:cm

**Sales Development, Marketing & Training Consultants
Professional Writing**

FINDINGS:

I have divided the answers to what courses or seminars taken in the last three years into three areas.

<u>TECHNIQUES</u>	Biased	Random	<u>DIAGNOSIS</u>	Biased	Random	<u>MANAGEMENT & INS</u>	Biased	Random
AK	13	5	Radiology	8	10	Markson	3	4
COX	3	3	Orthopedics	4	5	Singer	2	2
MPI	0	3	Disability	2	3	Parker	3	2
ACTIVATOR	0	2				Whithall	2	4
SPORTS INJ.	3	4				Ross	3	6
NUTRITION	1	2						
SOT	1	3						

The answer to the second question on what the doctors were interested in are as follows:

	Biased	Random		Biased	Random
TECHNIQUES	12	14	NEW RESEARCH	9	15
THEORY	2	3	E. HEALING	4	1
VIT/MIN	2	5	AVANT GARD	4	0
PAIN CONTROL	6	9	PAT/DC COMM	2	5
NUTRITION	11	14	EXERCISE	4	8
MARKETING	2	6	OFF PROC	1	3
PRAC ECO	1	3	COMPUTER	1	0

The crucial question asked was how do you learn best-reading/lecture/tapes hands on? The answer to this question of how each doctor learn best was the same for both biased and random groups. Hands-on rated first, lectures second, reading material third, and tapes rated fourth.

The biased sampling years in practice showed 1 to 10 years with the average of 5.1 years. The random sampling years in practice showed from 2 to 25 years with the average of 6.1 years.

Mrs. Beck noted far too low a rating on seminars. She requested materials to review and samples to see. As an instructor she realized chiropractors are being asked to learn, assimilate and critique material too rapidly. She suggested we break-up the teaching/learning process into several modules-a self study program,

material to be color coded while lecturing is in process and a final hands-on application of presented techniques.

Conclusions:

As a general though the chiropractic profession seems to be very interested in its Continuing Education Programs, especially in the areas of improving the services to the patients and the skills in getting better results

There is a need to improve our teaching techniques to a more sophisticated level. This should be done by changing how the material is presented to the class. This will be done with even more hands-on procedures and I will be changing how the lectures are presented.

There is a need to have the materials to be presented at the seminars available to the prospective doctors prior to taking the class. This will allow the doctors, to familiarize themselves with the material and techniques and be able to absorb more during the class. The lecture will become a second exposure to the material.

These materials will be available in a pre-paid course with self-programmed learning for all of my classes.

As far as the materials for the class, everything will be carefully explained for the student. No writing will be necessary, two color highlighting pens will be supplied to note important areas and ideas. This will free the doctor to concentrate on what is being presented and not on taking notes.

The new course material will be in a simplified flow chart sequence which will also contain the procedures, a list of problems that might occur, what not to do, and a description of what it feels like if there are abnormalities present and how it feels when it works right.

These finding will be implemented for the first time in an all new course presented by AKSI, "AK IN A NUT SHELL", which will condense a 100 hours of information into two 10 hour modules to be held on Sept. 12 & 13 and Oct 10 & 11, 1987.

This will enable the doctors to experience the AK techniques and immediately implement it into their practice.

If after finishing these two 10 hour modules the doctors wish to continue their studies in greater depth they can take a regular 100 hour/10 module course, which is also available.

This course will be open to any members of the chiropractic and dental profession as well as the allied healing arts including students.

The new self programmed materials will be ready and be available about two to three weeks before the seminar and can be purchased separately if the doctor cannot take the course or as a package with the course.

Our concern was to find out the areas chiropractors were interested in continuing education in and to explore improving teaching techniques so each person obtains as much information as possible from our classes. It is not only what you teach but how you teach it that affects how much material is retained and used in the chiropractor's private practice. Working with Arlene Beck we have developed the most comprehensive mode of instruction utilizing reading, self-learning, lecture, question and answer time with opportunity to ask considered questions and finally a hands-on module to experience both normal and abnormal structural reactions to the techniques. This many step learning process will enhance the material taught as well as greatly increase the material learned.

APPLIED KINESIOLOGY AND HUMAN PERFORMANCE

Robert M. Blaich, D.C.

ABSTRACT:

Data was collected at six post graduate seminars entitled, Applied Kinesiology and Human Performance. Reading rate, in words per minute, was used as an index of performance. Participants treated each other to eliminate neurological disorganization, (henceforth ND), using a specific procedure presented at the seminar. Participants were "pushed" to read faster than their predetermined comfortable rate. ND was again corrected, (if present), following the sessions of forced rapid reading. Psychological reversal techniques were introduced and treated relative to expanding the participants' reading rates. In 137 people who participated in the seminars, the average reading rate at the end of the seminar was approximately two and one-half times ($2\frac{1}{2}$) the original rate.

INTRODUCTION

In a very basic sense, "When you apply any kind of input which exceeds limits for the natural function of the tissue upon which it is being applied, it is injurious".¹ Historically most medical care has been oriented toward helping people to recover from some form of tissue injury. This usually takes the form of repairing, removing, or replacing the damaged tissue or trying to compensate for an imbalance created by the damage. With the tremendous advances of Applied Kinesiology, many techniques have been developed that are very effective in treating the results of stress on the body, as well as the aftermath of injury to body tissues. In addition to focusing on the effects of stress or the results of the inability of the organism to exceed certain limits, several questions might be addressed. Can the limits of body tissue and neurologic organization be altered to allow a higher level of efficiency or performance before injury occurs? If so, how can the limiting factor or factors be identi-

fied and minimized? Are we confined to treating the injured tissue which was injured because its limitations were exceeded, or can we intervene in such a way as to alter the limits, increase the performance, and allow the human body to adapt and sustain new levels of performance which exceeded the previous limitations?

In a larger sense one could ask, Can basic patterns be identified in the human organism when it is in the process of attempting to increase performance beyond previous limitations? Are there ways to enhance the organism's ability to change or to "reset" some level of function or performance according to the demands of a changing environment?

Several observations, on the part of this author, led to the questions posed by this study. In the course of examining and treating elite athletes who frequently push their bodies to the limits of performance and often exceed the previous levels of performance, these athletes would frequently exhibit various forms of neurologic disorganization (ND). The ND could be easily identified through the usual procedures of AK by having the patient therapy localize to K-27 and to have the patient therapy localize in the "cross K-27" pattern originally described by Walther in 1980. ² The fact that significant numbers of world-class athletes frequently exhibited the cross K-27 or homolateral crawl pattern was initially a puzzle. One aspect of this study questions the role of the "cross K-27" pattern in the process of altering levels of performance.

Another set of observations considered Delacato's description of ND and six phases or levels of severity that he described in, The Diagnosis and Treatment of Speech and Reading Problems.

Delacato considered, "1) aphasia, 2) delayed speech, 3) stuttering, 4) retarded reading, 5) poor spelling and handwriting, and 6) reading performance within the normal range but lower than mathematical performance" all to be

merely different degrees of the same problem, that of ND. It has also been observed that people in speed reading courses, when attempting to read faster, initially increase their reading rate but reach a point when they are fatigued, frustrated, and exhibit manifestations of switching, ocular lock, and/or K-27 or cross K-27 therapy localization. By continuing to push themselves some people move themselves through this stage of being "stuck" and attain a new level of performance which they are able to maintain. But the majority who get switched, stuck, and frustrated in the attempt to read faster, hover back to their original comfort zone in which they are either not "switched" or else some underlying switching limits their performance to this previous level. It seems that increasing reading rate, for many people, exceeds the limits of existing neurologic organization thus resulting in the ND.

These observations above gave this author the impression that the ND is very common and perhaps a "normal" phase of growth or transformation. In 1977, Ilya Prigogine, a Belgian chemist won a Nobel prize in Chemistry for his theory of "Dissipative Structures". In light of these observations above and the findings of this study, Prigogine's model appears applicable to the process of human growth and transformation or altering a "setpoint" or increasing levels of performance. There is a parallel between Prigogine's model and the observations of the ND that commonly occurs in a transformation process, that will be discussed later.

A study was designed to use Applied Kinesiology techniques to observe and evaluate what happens to people, in a functional neurologic sense, when pushed to perform past their comfort zone. The study used reading rate (words per minute) as an index of human performance. Several major questions were posed by this study. a) Does the correction of Neurologic Disorganization, through standard Ak techniques, affect reading rate in words per minute (as one index of human performance)? b) Does performance beyond or past an individual's comfort zone affect Neurologic Disorganization, either activating

existing subclinical neurologic disorganization or creating new disorganization?
and c) Does correction of the neurologic disorganization do something to support a new level of performance, thus affecting a person's ability to expand the comfort zone and maintain a new level of performance without creating further neurologic disorganization?

MATERIALS AND METHODS

The format of this study was a post graduate seminar about ND. The seminar was done in six different cities (prior to the compilation of this data) and was unique in the level of participation of the attendees. Rather than teach a seminar about ND, the seminar was arranged to give the participants a first hand experience of ND by having them perform various techniques to "unswitch" each other, then push their own levels of performance in the area of reading, and then reevaluate and treat each other depending on any further ND that developed.

The content of the seminar included a discussion of the "cross K-27" or homolateral crawl form of ND as well as a procedure of testing both "cross K-27" and K-27 therapy localization (individually) against different phases of respiration, to see if a) these indicators might show up with only one phase of respiration or perhaps if they showed in the clear to find if b) the indicator would be abolished by a certain phase of respiration. In 1980 Walther⁴ described a procedure of using a static challenge on the cranium to find a direction of force on the mastoid process that would abolish a positive therapy localization of K-27. At that time, testing for and correcting a fault that would abolish an indicator of switching was a unique approach. The idea of using a phase of respiration to find what "exposes" or "abolishes" an indicator of switching and then correcting the appropriate cranial fault is an extension of this original concept.

As an example, consider a patient in which a strong indicator muscle stays strong under all usual phases of respiration, full breath in, forced in, half out, full breath out, forced out, and half in. That same individual may be negative for therapy localization to cross K-27 or to K-27. Then testing the individual with therapy localization to cross K-27 may show a positive therapy localization but only under full expiration. In this example, the individual would also most likely be strengthened by a homolateral crawl and weakened by a cross crawl if asked to perform the homolateral and cross crawl patterns about 10 cycles of each.

Since the individual exhibited a cross K-27 therapy localization but only on expiration it seems sensible to correct inspiration assists on this individual. In this example a bilateral inspiration assist (which could be challenged for on each mastoid process to get an exact vector for correction) would most likely eliminate the cross K-27 and shift the patient to a "normal" state in which the individual is strengthened by cross crawl but weakened by homolateral crawl pattern. Continuing with this example, the individual may now exhibit a usual K-27 therapy localization perhaps with another phase of respiration such as with a half breath out or may exhibit the therapy localization to K-27 in the clear but have it abolished or negated by a half breath in. In either case the logical correction would be to locate and correct a temporal bulge, because of its correlation with half out weakness or half in strength, and very likely a category I pelvic involvement which commonly accompanes a temporal bulge cranial fault. The individual would now be free of indicators of switching. Naturally, the individual could lose some of the cranial correction, by appropriate challenge or neurologic insult, if there is a malocclusion, foot or gait related problem, hypersensitivity or allergy, dural imbalance, or other factors. Some of these and other factors were discussed at the seminars.

Various chemical components were also discussed. The role of Folic Acid⁵ in ND was discussed and at some point in the seminar all participants who exhibited ND were tested to see if the indicators would be abolished by Folic Acid. In the later seminars Hypothalamus tissue was also used by testing against the positive therapy localization of K-27 or cross K-27 with various phases of respiration. These substances were simply placed in the patient's mouth to evaluate whether this lingual stimulation had any effect on the indicators of ND. Hypothalamus tissue was used in the later sessions based on this author's observations that, approximately 90% of the time, K-27 and cross K-27 indicators with a phase of respiration are abolished with Hypothalamus tissue in the patient's mouth.

The format of the seminar was set up for the participants to measure their own reading rates, in books of their own choice, based on two minute timed sections where they were instructed to read at what they considered to be a comfortable level with good comprehension. Reading rate, in words per minute, was measured at various times during the weekend session. Although reading rate was calculated seven or eight times during the sessions, five readings for each session are reported here for the purpose of consistency. Reading rate #1 was done before any treatment was performed on the participants. Reading rate #2 was done following treatment to the individuals by having them evaluate and treat for the presence of a cross K-27 that showed up or was abolished by full breath in, half out, full breath out or half in and then doing the same for the K-27, using the procedure listed above. Therefore, participants were primarily correcting cranial and pelvic faults on each other to clear their bodies of these indicators of ND, i.e., the cross K-27 and K-27 with therapy localization with phases of respiration.

The participants were then instructed to place a paper clip in their book at the point at which they stopped reading and to mark off with a second

paper clip two times the amount of material they had just read in the previous two minute reading at a comfortable rate. They were instructed to now not worry about comprehension but simply make it to the second paper clip by the end of the two minutes. Thus they were "reading" at two times their comfortable rate, regardless of the comprehension level.

Two two minute readings were done at this rate. They were then instructed to use the paper clips to mark off two times this amount or four times their comfortable amount. The goal was simply to make it to the second paper clip by the end of two minutes.

After two two minute readings at this rate they were instructed to once again double the amount of material so they would now be "reading" at eight times their original rate. They were again instructed to not be concerned with comprehension, but simply make it to the second paper clip in the two minutes. For these two minute rapid drills, they were informed of the one minute mark and encouraged to use a finger to help pace their eyes for more rapid motion. Two two minute drills were done at eight times the original rate. They were then instructed to examine and treat each other in the same way they had previously done. From previous observations, it was suspected that many participants would exhibit some form of ND. After treating each other to correct for any ND, they were again instructed to read at a comfortable level with good comprehension for two minutes and then recalculate words per minute. This was reading rate #3.

Dr. Roger Callahan's concept and procedure of "Psychological Reversal"⁶ was presented. Participants were instructed to examine each other for possible reversal regarding 1) wanting to read faster, 2) being able to read faster, 3) being able to read at a specific level of their choice such as 5,000 words per minute even though their previous level might have been 500. Dr. Callahan's standard techniques, for "Massive Reversal" by tapping at triple heater three

bilaterally, and common reversal by tapping on small intestine three bilaterally, were utilized. Reading rate #4 followed the treatment for psychological reversal.

Other material regarding essential fatty acids, ND and neurotransmitters was presented at different times in the various seminars. Before the final #5 reading, the participants were again drilled to read at two times and four times their initial rate and then instructed to treat each other for ND using the methods listed above. This was followed by reading rate #5.

RESULTS

Of the seminars in six cities, 148 data forms were returned, which contained the data presented in chart #1.

Each vertical column lists the data for the five measurements of reading rate for one of the six seminars. For each reading rate, "T" indicates the total of the words per minute calculated by all participants in that two minute reading. This number was divided by the "Number (#) of participants" who contributed to that total, to determine the "Average words per minute" for that particular group in that particular reading.

The "All" column gives the total words per minute, number of participants, and average words per minute for all six seminars, for each reading.

Slight variations exist, in number of participants, for the various readings at a given seminar. This was simply due to people arriving late, leaving early, or missing a reading rate from some other reason. Because it is primarily averages that are being looked at here, it is unlikely that these slight variations would have significantly affected the averages.

Note that in number 3, data did not exist for three of the seminars. Because of variations in the sequences of the procedures, three of the seminars

	Pac.Palisades	Aspen	Vancouver	Los Angeles	San Fran	New York	ALL	% increase over #1	% increase over previous reading rate
#1 Total words per minute	1770	3624	6631	4800	15,606	8220	40,651		
# of participants	6	12	19	16	54	30	137		
Average words per minute:	295	302	349	300	289	274	297		
#2									
T	2100	5160	5890	8818	19,155	11,993	53,116		
#	6	15	17	25	54	31	148	21%	21%
Ave	350	344	346	353	355	387	359		
#3									
T			6160	9427		14,795	30,382		
#			14	25		29	68	51%	25%
Ave			440	377		510	447		
#4									
T	3096	7200		13,039	39,516	18,953	81,804		
#	6	15		22	53	30	126	119%	45%
Ave	516	480		593	746	632	649		
#5									
T	5430	8580	16,435	10,512	40,716	18,960	100,633		
#	6	12	19	16	54	30	137	147%	13%
Ave	905	715	865	657	754	632	735		
% of increase of #5 over # 1	207	137	148	119	161	131	147		

simply did not have data to fit the exact description of reading rate #3. Therefore totals and averages were computed for the data that existed.

Note also that number 4 is lacking in the Vancouver group. Although Psychological Reversal was presented, a timed reading was not done before further drilling.

Note also in the New York group that number 4 and number 5, contain the same data. This is because the final timed reading at the New York City seminar was done following the workshop on Psychological Reversal. Since this data fits the description of both number 4 and number 5, it is used in both places. If further drilling had actually been done before this number 5, the statistics may have shown an additional increase of number 5 over number 4.

The bottom horizontal column indicates the percentage increases of number 5 over number 1 for each of the individual seminars.

DISCUSSION

Because of the size of the statistical sample, all numbers in this study are significant in terms of the changes in performance. Rate evaluation #2 was 21% increased over rate #1. Although there was no control group of participants who did reading #2 without being treated, rate #1 actually becomes the control. The 21% increase could be directly attributed to the "unswitching" procedures that were performed on the participants prior to rate #2. It also provides us with an answer to question 'a' stated in the introduction,... The correction of ND does seem to effect human performance as measured by reading words per minute. This 21% improvement also supports 1 - the value of eliminating ND and 2 - this particular procedure for eliminating ND. Although numerous other systems and approaches for correcting ND are commonly utilized, no similar statistics are known at this time to compare this

method with other existing methods.

Rate #3 indicated a 51% increase over the initial rate (#1) and a 25% increase over the previous rate (#2) which had been based following the unswitching procedures used in this study. Since a high percentage of the participants developed or redeveloped ND by being forced to read beyond their comfort zone, but then were able to read 25% faster with just being unswitched, it could be speculated that being pushed beyond one's comfort zone creates or recreates ND which if corrected allows the people to expand their comfort zone and obtain and maintain a new level of performance. Even though the reading rate increased significantly, it cannot be concluded that this rate was due to the ND procedures following the forced rapid rate, without a control group of those who were pushed to read faster but were not treated for ND. It is possible that a control group would have performed as well or even better. Having observed all of the people in the seminars going through this procedure it might be worthy to note that the participants, after being forced to read considerably past their comfort zone, were quite agitated, frustrated, irritable, and seemed somewhat scattered and fatigued. It is unlikely, in the opinion of this observer, that they could have performed as well or better without having had the ND eliminated. It is the opinion of this author that this phenomenon is one of the shortcomings of many speed reading programs and is partly responsible for the usual lack of permanent improvement in words per minute. Many of the participants in this study had taken at least one "speed reading" course, at some point in their life, yet the initial average of this group at 297 was below the national average of 3-400⁷ words per minute.

Reading #4, which provided a 45% improvement over reading #3 and a 119% improvement over reading #1, followed the treatment for Psychological Reversal and exhibited the greatest single change in reading rate of any of the steps

done. Dr. Callahan's procedure seem to have a very significant impact on human performance as evaluated here.

The final reading followed, in most cases, additional drills to double and quadruple reading rate followed by treatment for any disorganization that developed in the process. Reading rate #5 was 147% above reading rate #1 and 13% above reading rate #4. Note that reading rate #5 is approximately $2\frac{1}{2}$ times reading rate #1.

Due to the format of these seminars and the gathering of this data, it was not practical to have control groups which would have allowed for much more significant conclusions from this study. For further studies, suggested measurements are 1) use some method for measuring reading comprehension to insure that reading rate in words per minute is of the same quality while the quantity may vary, 2) the percent of participants that exhibited ND at each stage prior to treatment - this information would have enabled conclusions relative to the frequency of ND being produced by pushing a person to perform beyond their existing comfort zone. 3) Another control that would be valuable as mentioned above, would be to measure words per minute in a group that had been pushed to read much faster than their comfort zone but were not treated and 4) follow-up data in terms of reading rate, one or two weeks after the seminar and one or two months after the seminar to evaluate how long term the changes were in both treated and non-treated groups.

Although the data presented here was collected on people specific to the phenomenon of reading rate and its relationship to ND, the author has observed the same principles at work in athletic performance, scholastic aptitude, organizational abilities and numerous other areas where personal

growth is a factor or performance is being expanded. The steps or principles used here to increase performance are 1) Clear the patient's system or eliminate as much as possible existing ND. 2) Push or have the patient push him or herself to obtain a new level of performance. At some point this step leads to a breakdown, depending on when the weakest link appears or when the organization of the system becomes "scrambled" because it is no longer able to coordinate, integrate, and sustain the new level of performance. 3) To perform some type of treatment which helps the system to reorganize or reset, allowing it to perform at the new level which previously produced a breakdown. 4) To support the system, enabling it to sustain the new level of performance. This usually takes the form of building up the weak areas as well as supporting the new level of organization and integration. This paper dealt primarily with steps 1, 2, and 3, and described a simplified (perhaps oversimplified for ultimate effectiveness - but standardized enough for data on 140 people), procedure that seems to be effective, according to the data at accomplishing steps 1, 2, and 3. A comprehensive approach to step 4 was beyond the scope of this study but has been and is being reported in the research of Dr. Goodheart⁸ and many of the Collected Papers by members of the ICAK.

A system was presented of identifying the presence of therapy localization to cross K-27 or K-27 and to find what would expose or abolish these indicators in determining what to correct on the patient. Of all the positive indicators that might be present on a patient at any given time, some unique property seems to exist regarding the specific factors that will abolish an indicator of switching. Correcting these "major" faults or indicators that abolish the switching seems to have a very significant effect upon the organization and reorganization of a patient's neuroendocrine and neuromusculoskeletal systems.

Consider for example, a patient who exhibits some form of a cross K-27 pattern and is strengthened by a homolateral crawl and weakened by a cross crawl. One could raise the question, is homolateral crawl the best therapy for this patient because the patient gets strong from doing it? If a doctor is examining a patient who is in the homolateral crawl pattern, the same question exists for anything that produces strength. A tendency with Applied Kinesiology testing is to assume that anything which creates strength is good for the patient and that which creates weakness is bad. However, if one is unaware that a patient is in a cross K-27 pattern, one probably does not realize that something which produces strength in this patient is probably something that reinforces the aberrant homolateral crawl pattern, just like the homolateral crawl itself produces strength.

The cross K-27 pattern has been correlated with schizophrenia⁹, and it is this author's experience that a cross K-27, in the clear, usually correlates with the symptoms of schizophrenia. It is also this author's observation that many creative and artistic individuals, as well as elite athletes, also exhibit a cross K-27, either "in the clear" or sub-clinically, perhaps only revealing itself under a specific phase of respiration. It is this author's speculation that cross K-27 (homolateral crawl pattern) is a neurologic state that people can "normally" go into and come out of, depending on the type of activity being performed. Although many creative people pass into and out of this cross K-27 pattern, history is filled with artistic people whose lives were devastated by being stuck in a homolateral crawl pattern. Van Gogh and Hemingway are but two probable examples. There is a certain fragility or instability of patients who are "stuck" in a cross K-27 pattern. As clinicians we sometimes devote great effort at trying to help stabilize an extremely unstable patient who may be unstable because the neuroendocrine system is locked into a "holding pattern" such as the homolateral crawl pattern.

An observation was mentioned earlier that approximately 90% of the time when a cross K-27 or K-27 shows a positive therapy localization with a phase of respiration, that Hypothalamus tissue placed in the mouth will abolish this positive indicator. One theory about the human performance phenomena reported in this paper is that perhaps the ND that develops when a person is pushed beyond the comfort zone is hypothalamic related and actually a function of either a failure of the hypothalamus to alter a "setpoint" which would allow for the new levels of performance or perhaps the confusion develops relative to "getting into" or "getting out" of the hypothalamus neurologically. In a paper entitled, "Hypothalamic Model of Addition in Ecologic Mental Illness", Iris Bell¹⁰ deals with the hypothesis that, "The hypothalamus sets the tone of responsivity to endogenous and exogenous substances by neural and hormonal signals for all the tissues of the body". Bell refers to Mountcastle's, Medical Physiology and the concept that "In deciding what commands to give the body, the hypothalamus regulates homeostasis in the body by establishing operating setpoints around which it permits the various functions which it controls to vary - for example, body temperature. With respect to food the hypothalamus holds the setpoint for body weight near a precise value appropriate for the energy balance for the particular body".¹¹

It is very possible that identifying and correcting specific cranial faults which shift the patient from homolateral crawl pattern to a cross crawl pattern is in fact altering a hypothalamic setpoint, the alteration of which now allows the body to perform comfortably at a level which previously created disorganization by overtaxing the existing setpoint. One could also understand the extreme significance of correcting a specific cranial fault to take a patient from a homolateral crawl to a cross crawl pattern, rather correcting any other single thing or group of things on that patient, the correction of which may serve to reinforce the aberrant homolateral crawl

pattern.

Another hypothetical model which might help to explain some of the phenomena reported here is the Prigogine theory of "Dissipative Structures", which won the 1977 Nobel Prize in chemistry. Although Prigogine's work contains extremely complex mathematical calculations, a brief description of his concept is presented here for the purpose of discussing this data.

Prigogine refers to open systems as dissipative structures, in that their form or structure is maintained by a continuous dissipation of energy.

All living things are dissipative structures, and the more complex a system is the more energy is needed to maintain the increased interconnections.

In the words of Dr. Dossey in the book, Space, Time and Medicine,

["...dissipative structures interact with the local environment by consuming energy from it and by eliminating the by-products of the utilization back into the environment. Energy consumption and utilization within dissipative structures is not always a smoothly functioning process. Energy flow within the structure may cause perturbations or fluctuations, within the system. If the perturbations are small, they are dampened; but if they are great they may initiate severe changes within the structure. The more complex the structure, the greater the energy flow required for its survival, and the greater the internal perturbation is likely to be if it occurs. In other words, increasing complexity generates a need for increasing energy consumptions from the environment which in turn gives rise to increasing fragility. But ironically it is this feature of the dissipative structure that is the key to its further evolution to its greater complexity. For if the internal perturbation is great enough the system may undergo a sudden reorganization, a kind of shuffling, and "escape to a higher order", organizing in a more complex way."] ¹²

It is the opinion of this author that the fragility and instability of the dissipative structure and the reshuffling that occurs in the "escape to a higher level of order" is not unlike the presence of a cross K-27 pattern and the phenomena of increasing performance when this system reshuffles to allow for a new setpoint and a new level of performance. The correction of faults,

which may have been preventing the system from reshuffling or escaping to a "higher level of order", is a classical form of eliminating nerve interference. In Applied Kinesiology testing of a patient, a system "out of balance" exhibits a form of cross K-27 or K-27 (among many other indicators). The identification of the form of K-27, including what reveals it or what negates it, inherently contains the information necessary on how to balance the system. It seems that because of the nature of growth, transformation, change, and altering levels of human performance, this is a very common phenomenon. The ND described in this paper is a classic form of ND described by Delacato¹³ and is also an example of dysponetic signaling described by Whatmore and Kohli in The Physiopathology and Treatment of Functional Disorders.¹⁴

A significant value of using these "unswitching" procedures in an examination and treatment is that they establish a frame of reference. The frame of reference is that rather than unswitching a patient prior to treatment the examination and treatment become the method of unswitching the patient. In this frame of reference, the patient's body reveals in an orderly and sequential manner what, if any, therapy is necessary to move out of disorganization; from cross K-27 to K-27 to neurologic organization. It is noteworthy that a clinician may have a large population of patients who do not exhibit any of these "switching" patterns. The presence of these patterns seems to apply mainly to people who are on some path of personal growth, transformation, or change or who have had a major "shake-up", trauma, or stress in their life.

Step 4, mentioned above, entails building up the weakness and supporting the new level of organization and integration. The question is what can be done to not only support a new level of function but to get it ready to withstand any further stress. One of the pioneers of this concepts James P. Isaacs, refers to the phenomenon of 'Ergodization'. As he describes, "An ergodizing

agent is an effector of cellular dynamics which provides pathways for a given process or action to assume many more complexions than would be possible than without its presence".¹⁵ He uses trace elements as a prime example of ergodizing agents. Ergodizing agents increase the number of metabolic pathways or options to a system when it is presented with various stresses. In a sense, the procedures presented in this paper may function by contributing to the ergodization of a system. The correction of faults, that were preventing a resetting or the attainment of a new level of stability in one's system, allows for new levels of performance probably by increasing the pathways, options, or complexions in the neuroendocrine system. Schmitt¹⁶ has described and developed some of Isaacs' concepts and offers much additional insight into their significance.

Although the data presented here, using reading rate, was only one measurement of human performance and did not deal extensively with metabolic imbalances, when these human performance concepts are applied to athletic endeavors and to elite athletes, many more gross metabolic disturbances expose themselves as underlying imbalances that precipitate the disorganization. These observations will be discussed in another paper.

CONCLUSION

Without a course in speed reading 137 people increased their reading rate an average of $2\frac{1}{2}$ times in the course of a weekend seminar. This improvement in reading rate was obtained using Applied Kinesiology techniques to treat people to minimize or eliminate ND, pushing them beyond their comfort zone to perform at a higher rate than their previous limits, and then treating any disorganization, deficiencies, and imbalances that developed or were exposed through the added demands of the increased performance.

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INCIDENCE OF VARIOUS FAULTS IN A POPULATION OF ELITE BICYCLISTS

ROBERT M. BLAICH, D.C.

ABSTRACT:

Between 1982 and 1987, the author had the opportunity of evaluating and treating over 100 World Class or Olympic bicyclists with Applied Kinesiology and Chiropractic procedures. Many of the treatments were during extended stage races while some were at training camps while preparing for major races. Patient records of 82 of the elite bicyclists were surveyed to determine the frequency or incidence, in this population, of various "faults", imbalances, and deficiencies commonly identified in Applied Kinesiology practice. The most common faults and their frequency is listed.

INTRODUCTION

The patient population included numerous medal winners from the 1984 Olympic Games: 2 Gold, 1 Silver, 5 Bronze, as well as the winner of the 1984 Women's Tour de France, most of the men's United States Team (sponsored by 7-11) in the Tour de France of 1986 and 1987, as well as many members of the United States amateur teams of 1983 through 1987, and many participants in the Coors International Bicycle Classics, 1982-1987.

MATERIALS AND METHODS

Due to the diversity of symptoms and conditions for the treatment of these athletes, no specific or set protocol was followed for examination and treatment. The athletes were treated for clinical effectiveness, not research purposes. The bicyclists were treated by a Diplomate of the International College of Applied Kinesiology, using usual and customary Applied Kinesiology

procedures to treat the patients for their immediate problems as well as trying to identify and build potential areas of weakness. The time constraints and intensity of treating these elite athletes, usually under great pressure to improve performance, did not lend itself to screening all patients for all the faults listed. Therefore there is a "built-in" bias of what this examiner considered to be most significant. However, this was dictated considerably by the symptoms, complaints and patterns most prevalent in this population of patients.

RESULTS

Listed, in order of frequency in the 82 patients, are the most common faults recorded in the patient records. Note that since some of the patients were treated on numerous occasions, this survey does not represent 82 patient visits. If a patient had a particular fault at any time during the course of treatment, it is listed below. The information is actually tabulated from well over 300 patient visits.

GRAPH I

FAULT	FREQUENCY (in numbers of patients with this fault at any one time)
Category II	58
Cranial Fault	43
Cervical Subluxation	43
Psoas Weakness (one or both)	43
Category I	40
Thoracic Subluxation	33
Sartorius Weakness (adrenal related)	33
Lumbar Subluxation	28
Occiput Fixation	24
Uppercervical Fixation	22
Repeated Test Weakness	19

GRAPH I - continued

Pectoralis Major Sternal Weakness (liver related)	14
Lower Thoracic Fixation	13
Retrograde Lymphatic	12
Quadriceps Weakness	12
Homolateral Crawl Strength	9
Infraspinatus Weakness (thymus related)	9
Hiatal Hernia	8
Tensor Facial Lata Weakness (cuboid related only)	6
Pitch	5
Roll	5
Cervical - Dorsal Fixation	4
Yaw	3

DISCUSSION

Note that the Category II - pelvic subluxation is by far the most common single "fault" in this survey. Of the 58 patients who exhibited this lesion, 50 were of the posterior ilium variety, and 8 were the posterior ischium variety. It is likely that the high incidence of the posterior ilium subluxations is related to a) the high incidence also of the sartorius weakness and adrenal involvement as well as b) the high incidence of quadriceps weakness. The next most common fault was the cranial fault, most of which were of the inspiration assist, spheno-basilar inspiration assist, or temporal bulge. The high incidence of cervical subluxations is understandable in light of the number of falls or crashes that bicyclists sustain and the relatively high incidence of upper cervical fixations often seems to be related to head position on the racing bicycle. Many of the psoas weaknesses were related to foot pronation or tarsal tunnel type problems. Many of the thoracic subluxations

were anteriorities. The repeated test weakness most often related to essential fatty acid deficiencies.

CONCLUSIONS

The high incidence of structural faults in this population is thought to be due to the rigors of training and racing as well as the inevitable "crashes" or falls that occur periodically. The high incidence of adrenal, liver, lymphatic, and essential fatty acid imbalances, as well as fixation complexes, strongly suggests that an optimal approach to treating elite bicyclists would include methods for effective diagnosis and treatment of these problems.

Copper Status: The Other Side Of the Coin

A Preliminary Report and Review

Anthony Brea D.C.

ABSTRACT: Copper serves as a cofactor in a number of clinically significant biochemical pathways. Notably, it is involved in the formation of lipids, steroids, neurotransmitters and connective tissue and serves as a component of several enzymes including super oxide dismutase. Recent studies have shown the effects of its deficiency include anemia, glucose intolerance, hypercholesterolemia, immune system suppression, bone demineralization, and myocardial arrhythmias. Its involvement in these pathways and conditions make it an important nutrient to evaluate on a preliminary and ongoing basis in patients presenting musculoskeletal, neurological, and other related problems.

An aid in the evaluation of copper involving the utilization of standard muscle testing procedures, as outlined by Kendall and Kendall, in conjunction with a *mode of challenge* developed by the author, is presented. This *mode of challenge* is the outgrowth of research conducted by Becker describing the role of copper in the conduction of piezoelectric currents in bone.

Literature published concerning toxicity of copper, has gained much attention in certain segments of the scientific community as well as the popular press. On the other hand literature describing deficiency have been given less emphasis. Nonetheless, several authors have stated that subclinical deficiency may be common and in fact, more prevalent than toxicity.^{4,8,13,23} Literature continues to accumulate in support of this contention. The average intake of copper in the US is 1.20-1.30 mg.^{15,26,27} The majority of diets analyzed since 1966 contain less than 1.30 mg. and a considerable number of diets contain less than .65 mg.^{13,18,23} The 1980 RDA for copper has been set at 2.0-3.0 mg./day from ages 11 through adulthood, and from 1.5-2.0 mg./day for children from the ages of 7-

10. These statistics suggest that copper nutriture is at best marginal and on the average insufficient.

Copper is an essential trace element that functions in many clinically significant biochemical pathways.^{26,27,31} Its activities include participation in the formation of myelin sheath, collagen and elastin. It aids in the production of hemoglobin, epinephrine, norepinephrine, cortisol and several other adrenal hormones and is a cofactor or component of many enzymes, including superoxide dismutase. Deficiency of copper has been associated with a number of different conditions. These include alterations in normal neurotransmitter concentrations, faulty collagen formation, hypercholesterolemia, cardiac arrhythmias, hypothermia, neutropenia, and glucose intolerance. Copper's involvement in these pathways and conditions are discussed further in the following sections.

Conduction of Bone Piezoelectricity

In order to appreciate one of the important roles that copper plays in bone there are two concepts from electronics that need to be defined.

The first is called the piezoelectric effect. This effect is defined simply as the release of electrons from an object caused by the bending of that same object. The second concept is the positive-negative(PN) junction. This is a junction at which electrons flow easily in one direction and with resistance in the opposite direction. The net effect of this is that electrons flow in one direction across this junction.

Bone tissue among other things is made up of copper, collagen fibers and apatite crystals. Becker³ found that these structures in bone joined together to form a PN junction. He found that collagen had

piezoelectric properties and that deformation of bone caused the collagen in it to release electrons. The copper in bone serves as a peg that holds the collagen and apatite crystals together. It also serves as a conductor of electrons at the collagen-apatite PN junction in bone allowing for the unidirectional flow of electrons. When bone is stressed and its collagen is deformed electrons are freed from the fibers. These electrons then flow across the copper collagen-apatite PN junction into the crystal matrix and finally to the area of compression. Once there, they stimulate the osteoblastic activity needed to reinforce this area against future compressional stress.

PROCEDURES AND RESULTS

It was the author's suspicion that any dysfunction in the normal flow of stress induced piezoelectric currents in bone would cause a neurological response detectable by muscle testing. The mode of confirming this hypothesis was simple. A small sample of subjects were use for preliminary testing. The method of testing involved finding an intact indicator muscle. Subjects were then randomly tested by applying a bending force [compressional bone test](CBT) to several long bones. The intact muscle was tested after each compressional test. A large number of those tested weakened regardless of the bone stressed or the location of the muscle used as an indicator. There was generalized muscle weakness caused by stressing the bone. Following a more detailed inspection it was determined that the mandible would not respond to the initial CBT. Continued observation of this phenomenon on more than 100 subjects has confirmed the original findings and has expanded considerably the author's understanding of the factors involved in adequately

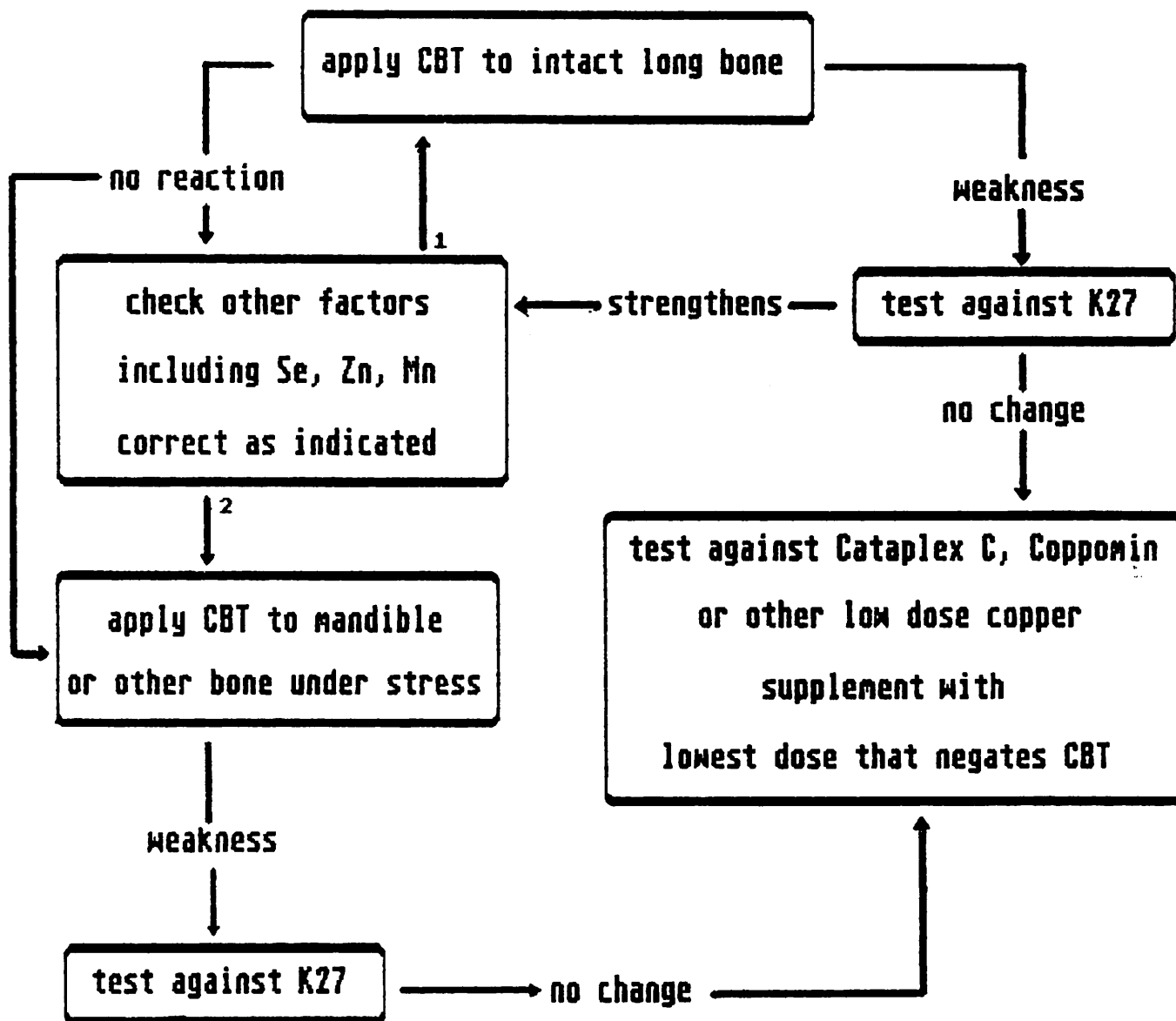
screening this test. These factors will be discussed further below. Statistical data will be provided in a supplementary paper scheduled to be presented for publication in the 1988 Summer ICAK Collected Papers.

Attempts to determine a nutritional component to this challenge were made by testing it against different components of bone. The only component that was able to eliminate the response with little or no recedivism was copper.

DISCUSSION

Analysis of the responses of this larger sampling has revealed that disturbances in the metabolism of zinc, manganese, and selenium often need to be corrected either by manipulative procedures and/or supplementation before the compressional bone test(CBT) could initiate a generalized muscle weakness pattern. *This observation does not hold true for subjects who are switched.* Among these individuals CBT will elicit a response that will often be eliminated by manipulative procedures. However it has been the authors observation that recedivism in this group is very high (70-80%) and that correction of the metabolic inadequacies of Mn, Zn, and Se is necessary before a true assessment of copper status can be made. This effect may be related to the concept of electron poisoning. Approximately 70%-80% of subjects tested required copper supplementation. The initial sources of copper used on these subjects was Cataplex C from Standard Process Labs and Coppomin from Nutridyn. The lowest possible dose that would negate muscle weakness elicited by the CBT was supplemented T. I. D.

Additionally, at least two different stages of copper replenishment have been identified. Initially, muscle weakness in response to the



Flow chart for the compressional bone test

CBT is negated by manipulative procedures and/or supplementation with copper. Once correction has been made subsequent CBT directed at intact long bones will no longer elicit a response. This is representative of an initial or *first* stage. However CBT applied to the mandible and/or any osseous structure under strain related to copper status will now test positive in those subjects who require additional manipulative and/or supplementation therapy. This procedure appears to be distinct from the CBT applied to the long bones of the skeleton and is representative of a subsequent or *second* stage. The initial negation of the generalized skeletal CBT appears to be related to a particular type of Gamma II dysfunction.

Oral challenge with a number of nutrients and one manual challenge technique have been found to have a high percentage correlation with the responses observed using *first stage* CBT. These include ascorbic acid, molybdenum and the aerobic muscle test. Ascorbic acid in animals has been found to inhibit absorption of copper in the gut.^{17,26} Molybdenum in conjunction with sulfates has also been found to do the same. These observations probably explain the mode in which these substances will elicit muscle weaknesses that are eliminated when copper status is addressed. The aerobic muscle test's correlation with the CBT and copper status is probably a function of at least two factors. 1) Copper aids in the absorption of iron in the gut and the mobilization of iron from the liver and other tissue stores. 2) Copper also aids in the oxidation of cytochrome c and therefore plays a crucial role in aerobic respiration. Aerobic respiration of course is the mode in which fatty acids are oxidized to provide energy.^{22,31}

That evaluation of copper status can be aided by applying

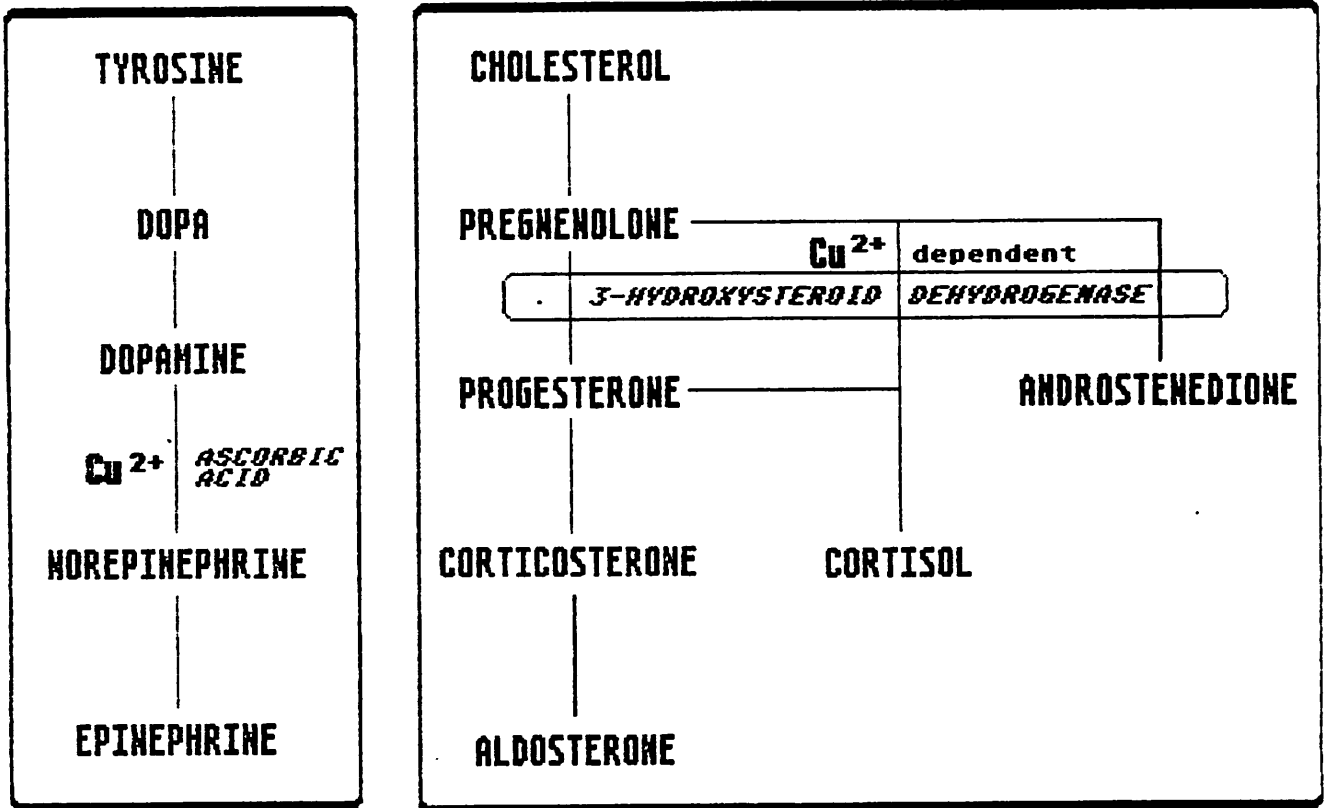
compressional stress to bone is reasonable considering that 50% of the total amount of copper in the body is in skeletal tissue. The reason that CBT can cause muscle weakness is unknown. It may be a factor related to bone piezoelectricity. This phenomenon provided for the author a working hypothesis. However it is possible that the bonding function that copper plays in respect to collagen and apatite may be responsible for the CBT induced muscle weakness. It is probable that both factors are involved.

It has been this author's experience that supplementation with copper has been considerably beneficial in patients with inflammatory joint conditions. The most striking response has come from individuals with joint pain. Often improvement in ROM and significant decrease in pain occur in the office while the patient is chewing several tablets of the appropriate source of copper. Several mechanisms in support of these findings have been discussed in the literature.^{1,2,8,23,27} They include copper's roles in

- 1) superoxide dismutase
- 2) prostaglandin metabolism
- 3) glucocorticoid synthesis
- 4) collagen and elastin formation
- 5) bonding of collagen apatite junction

In addition, the relationship of copper to piezoelectricity in bone may also be a significant factor.

Much literature has been published concerning the anti-inflammatory role of copper both in vitro and in vivo. The mechanisms by which it carries out this function are not completely understood. Its involvement is believed to be along multiple pathways. Of course the roles of adrenal glucocorticoids and superoxide dismutase in



Simplified diagrams illustrating the adrenal hormones dependence upon copper for their synthesis.

inflammatory conditions is well known. In the adrenal cortex 3-hydroxysteroid dehydrogenase converts pregnenolone into progesterone which is a precursor to the mineralcorticoids and glucocorticoids, aldosterone and cortisol, respectively.^{22,27} This enzyme is copper dependent and deficiency has been related to decrease adrenal steroid production and subsequent compensatory hypertrophy of the cortex.

In addition, copper has been found to inhibit bone resorption.^{11,23} In vitro studies have determined that it blocks prostaglandin's

stimulatory role in bone resorption.

The following is a brief review of some of the clinically significant pathways in which copper is involved.

Copper and Lipid Metabolism

Klevay from the U.S. Department of Agriculture has studied the effects of copper deficiency on rat metabolism. Klevay¹⁵ found that copper deficient rats made so by a diet with a high zinc copper ratio developed high blood cholesterol, arrhythmias, degeneration and ischemia of the heart. Many studies have either directly or indirectly linked Klevay's findings to humans.¹⁸⁻²⁰ For instance, several cholesterol lowering drugs have been found to function by apparently decreasing the zinc to copper ratio in the liver which is the primary site of cholesterol synthesis and excretion. Wester found in comparing myocardial tissues of victims of accidents to victims of myocardial infarctions lower copper levels in the latter group. High fat foods like meats and dairy products that have long been associated with increased risk of CVD have extremely high zinc to copper ratios.¹⁵ One study found that animals fed diets including hypercholesterolemic agents were spared long term elevated serum cholesterol and CVD by simultaneously feeding higher amounts of copper.¹⁸ Lastly, several authors have reported human cases of hypercholesterolemia and cardiac arrhythmias in subjects with borderline or deficient serum copper levels and/or high zinc to copper ratios.^{19,22,30} This author has observed three cases of subjective patient-reported heart irregularities that have been eliminated by copper supplementation.

Rieser^{4,29} found that this deficiency in conjunction with a diet high in fructose further aggravate these conditions. He also found that copper deficient rats had higher blood glucose levels after a glucose load as compared with copper supplemented animals. This induced glucose intolerance is at least partially due to his observation that rat adipose tissue binds less insulin in the deficient animal. Fructose intake has been found to increase copper deficit in animals. Liver losses of up to 66% have been found with concomitant normal values of RBC Cu-SOD, ceruloplasmin and serum copper levels. This observation underscores the difficulty that often accompanies evaluation of copper by these methods.

In humans, increasing levels of fructose has been found to cause increasing levels of cardiac arrhythmias. This observation in humans may be caused by fructose's ability to exacerbate copper deficiency.⁴

Klevay²⁰ has reported that copper deficiency causes a decrease in the production of phosphocholine transferase an enzyme necessary in the production of phospholipids, phosphotidylcholine and phosphoethanolamine. Phosphoethanolamine, a component of dietary lecithin has been found to decrease cholesterol concentrations in the blood. The role of copper in its formation may explains at least in part the effect of copper deficiency on cholesterol levels. Copper also aids in the production of bile salts necessary for the emulsification and fecal excretion of cholesterol.⁴ Lack of bile can cause increased absorption in the gut and precipatation in the gall bladder of cholesterol.

Copper and the Nervous System

Copper helps in the formation of CNS and peripheral norepinephrine(NE). It is a component of dopamine-B-hydroylase which converts dopamine into NE. This enzyme's activity is inhibited by copper chelators resulting in a decrease in the production of NE.⁶ It would seem likely that a lack of copper would likewise cause a decrease in NE. Several authors have in fact reported this observation.^{7,25}

Decrease in the production of dopamine (DA) and NE has been reported in copper deficient rats. Repletion of copper levels restored NE in the brain to control levels but had no effect on DA concentrations. Copper deficiency cause reversible catalytic inhibition of the adrenergic systems which was corrected by supplementation. On the other hand, irreversible structural damage to dopaminergic system similar to that found in the Parkinson lesion is effected by deficiency. In one study, copper deficiency was found to reduce the myelin yield in the brain as much as 50%.²⁶ Copper deficiency causes a decrease in the production of phosphocholine transferase an enzyme necessary in the production of phosphotidylcholine and phosphoethanolamine. These phospholipids are necessary for the normal synthesis of myelin. This may be a factor in the deficiency-initiated structural damage.

Copper and Connective Tissue

Copper is also a component of lysyl-hydroxlase which acts upon immature collagen fibers in such a way as to allow them to form cross linkages. Lack of copper leads to improper collagen formation and

connective tissue disorders. Depending upon the species the area that is first compromised varies. Effects have been noted in the myocardium, bone, skeletal muscle, and blood vessel walls. It has been suggested that in humans changes in ossification associated with copper deficiency are the result of improper crosslinking of collagen fibers.^{26,27} Becker's observation of copper's role in bone may also play a role.

Clinical Conditions that Warrant Copper Evaluation

- 1) Connective tissue problems
- 2) Inflammatory conditions
- 3) Hypercholesterolemia and hyperlipidemia
- 4) Anemia nonresponsive to iron
- 5) Glucose intolerance
- 6) Individuals on ascorbic acid supplementation
- 7) Individuals on zinc, manganese, or molybdenum supplementation
- 8) Individuals on high sugar diets
- 9) Other related problems

Conclusion

According to available data it appears that copper deficiency is common. The results of its deficiency include alterations in the metabolism of many clinically significant pathways. Its widespread involvement make it an important nutrient to evaluate on a preliminary and ongoing basis. The Compressional Bone Test is presented as an aid in the evaluation of copper status.

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SUCCESSFUL PSYCHOTHERAPY BY TELEPHONE AND RADIO**Roger J. Callahan. Ph.D.****Abstract**

The following article describes some of the author's experiences treating anxiety and phobias on television and presents a summary of the results of his attempts to treat call-in guests on a number of radio shows across the country and Canada over a period of one year.

A few other problems than anxiety and phobias were also treated. The degree of success achieved with these treatments is unprecedented and opens many possible vistas in the way psychotherapy is conducted.

The outstanding degree of success would not have been possible if the phenomenon of psychological reversal were not understood and successfully treated.

This article does not discuss the special procedures used in treating patients over the telephone. These procedures will be the subject of another paper.

SUCCESSFUL PSYCHOTHERAPY BY TELEPHONE AND RADIO

Roger J. Callahan, Ph.D.

(c) 1987

Anxiety, according to Chaplin's Dictionary of Psychology, is a "feeling of mingled dread and apprehension about the future without specific cause for the fear." A phobia is defined as "a strong, persistent, and irrational fear elicited by specific stimulus or situation."

Phobias and anxiety are the most common psychological problems in the country, according to recent extensive surveys of mental health. Most clinical practitioners in the field are aware that these problems are even more prevalent than the surveys indicate.

The conventional treatments for these problems are very expensive, time consuming, painful to undergo, and often totally ineffectual. Highly trained professionals who typically work with one patient per hour per week must spend months with the anxious or phobic patient and then hope that the problem is more under "control." An actual cure for the problem is a rare event.

Against this background, it is to be expected that people would be skeptical of my claims of dramatic success achieved with ease within minutes.

Therefore, when I was promoting "The Five Minute Phobia Cure" (Enterprise Publishing, Wilmington, Delaware) I did not wish to appear on TV and merely talk about the book as I had done several years earlier with "It Can Happen To You: The practical guide to romantic love (A Signet Book: New American Library; which was a Book-of-the-Month Club Selection).

The love book illuminated a little known, hitherto unnamed, and ubiquitous phobia that I call "amourophobia" which I believe is one of the major reasons that in a country loaded with successful people of all sorts who are unusually devoted to human happiness, and uniquely in favor of romantic love (despite the antagonism of most professionals), we find very little enduring success in the realm of romantic love.

It was perfectly appropriate to talk about the love book. "The Five Minute Phobia Cure", however, presents such revolutionary claims that I would not expect anyone to believe me if I merely talked about what I do. The burden of proof upon anyone who makes extravagant claims that flaunt common knowledge and experience is upon the person making such claims. It was up to me to demonstrate why serious people should take me seriously.

When I was called upon to appear on various television shows I explained to the producers that I didn't want to merely talk

about what I do since I expected disbelief but if they would get volunteers I would attempt to treat them right on the show. I explained that the more severe and long-lasting the problem the more dramatic would be the result (if successful).

I asked them to restrict the people to those whose cure could actually be demonstrated. For example, we wouldn't want someone who is afraid of flying unless we could take them in an airplane in order to demonstrate that they were actually better after the treatment.

Since location shots are quite expensive we didn't do too many of them. We did do a location shoot, on "Evening Magazine" (a national show) for a driving phobia in Maryland with a very grateful lady who had been unable to go on freeways or over bridges for 18 years and who had not been helped by other professional approaches. A location shoot was also done to treat fear of heights and elevators in Los Angeles at the Bonaventure Hotel, with its' outside glass elevators - a nightmare location for acrophobes and claustrophobes.

In the TV studios many were treated who were afraid of ladders, snakes, needles, spiders, cats, and other such things or situations whose actual cure could easily be demonstrated in the studio. Tom Snyder, for example, was cured of severe phobia for ladders that he had had for eight years.

I put my professional reputation on the line because of course it was possible for me to fail. I did fail a few times but for the most part the television tour was very successful with a success rate of well over 90%. An unprecedented high degree of success. As Regis Philbin said on his show in New York, "We have had many authors come through here with their self-help books but we have never seen anything like this."

After the television tour it came time to do a series of radio shows. Again, I didn't want to just talk about the therapy but I really didn't know how it would be possible to treat people without being with them.

To make a long story short I did develop procedures for treating over the telephone and hence by radio.

I was interviewed on a total of 23 radio talk shows between July 6, 1985 and June 28, 1986 which were recorded on audio tape. The listening guests were invited to call in if they were experiencing an anxiety problem at the time of calling. They were told that I would attempt to help them with the problem over the air.

The reason we asked for them to be experiencing a problem at the time of calling was so that the therapy, if it worked, would be

able to show a difference. If someone isn't experiencing anxiety at the time of treatment they can still be treated it's just that they are not good to use for a demonstration since there can be no observable difference as a result of treatment. Though the listeners were mainly asked to call if they experienced anxiety we also got a few calls for other problems and attempted to treat them as well.

The guests were asked to express the degree of emotion that they were feeling at that moment, in terms of the commonly used ten point scale where 10 represents the highest degree of a problem or the most discomfort possible while 1 represents the absence of a problem.

There is no better index of emotion than the person's subjective report. Though there are physiological correlates of various emotions their measure is not a valid or reliable indication of actual emotion which, by definition, is subjective. The problem is the same in the attempt to measure physical pain, there is no physiologic indicator which can substitute for the patient's subjective report.

The results include everyone who called in and also those whose treatments were interrupted because time ran out or where the phones were accidentally disconnected before treatment was concluded. This stringent procedure was carried out in order to

minimize evaluational bias.

In order to demonstrate the power of the treatments themselves and to minimize suggestion, placebo, or hypnotic effects, when talking to the call-in subjects, I assume a rather cool business-like tone in contrast to the warm tone used in hypnosis or psychotherapy. Also, I avoid direct suggestion or relaxation procedures in order to highlight the effect of the treatments themselves. Nevertheless, it was typical for the subjects to report spontaneous relaxation after the treatments even though no mention of relaxation is ever made.

Incidentally, as one who has used hypnosis and suggestion for over 3 decades of clinical practice, I can tell you that they can't even come close to these new procedures in effectiveness or rapidity. If the effects WERE due to suggestion or hypnosis it would be the most significant breakthrough in those methods since their inception. However, I can assure you that the results are not a result of suggestion or hypnosis. That was the first possibility I examined when I first began developing these rapid treatments nine years ago. In fact, I am usually working in the face of extreme negative suggestion since the subjects do not expect to receive help from my novel and unusual procedures. An expression that is heard often from the amazed and cured individual is "I don't believe this!" as they are engaging in comfort with the formerly threatening situation or event.

For a listing of the various problems treated and the pre and post-treatment scores see the tables below. As you can see there were a few problems other than anxiety and phobias that were treated. Rapid treatments have been developed and are being developed to treat every psychological problem.

The other problems that were treated (which require different treatments than anxiety) were: chocolate addiction: trauma due to an accident: war trauma: and what I call "love pain" (the pain of losing a lover through death or rejection). Until now there has never been an effective treatment for love loss pain.

Psychotherapists typically offer words of encouragement and assure the victim that eventually time will heal the wound (sometimes it doesn't). The summary of the data includes these problems as well as all fears, phobias and anxieties that were presented.

A limitation of treating over the radio, as opposed to TV is that it usually is not possible to actually test the results in reality to see if the person is better. Remember that the TV guests were selected on the basis that it could be shown that they actually were better. For example, if they were terrified of snakes then a snake would be presented to them to see, not merely how they imagine they would be with a snake, but how they actually are in the presence of a real live (and usually very

large!) snake. This limitation is the same limitation that all psychotherapists face when treating people in their offices. We never know how the patient is doing for sure until they go out into the world and test the treatment.

There was, however, one opportunity to see how well the caller was really doing when he presented the problem of public speaking, because that is what he was actually doing as we worked. Usually, it makes a nervous public speaker even more upset if he has a lot of people listening to him. We had an acid test for them since none of them had ever before talked to so many people.

Public Speaking

Most surveys of phobias list public speaking as the most common fear or phobia and indeed it was the most frequently mentioned fear in this study. Of the 69 people presenting problems 11 of them presented a fear of public speaking.

As mentioned, it was particularly interesting to treat this fear because it was a live test of the power of the treatment since the people were actually nervously engaged in public speaking, while talking over the radio. They could realistically evaluate the success of the treatment without relying solely on their imagination. It was also possible for listeners to discern the

improvement in their voice as they became relaxed as a result of the treatment.

In this real test, as opposed to the solely subjective results of the other fears treated, the results were comparable to all the other fears treated. Here is an analysis of the public speaking fears treated:

Total public speaking: 11

Average score before treatment: 8.8

Average score after treatment: 1.9

Average time for treatment: 5:16 mins.

All of the 11 public speaking fear volunteers were dramatically and significantly helped by the Callahan treatments.

These results, remember, were not obtained in the privacy of my office but were witnessed by literally millions of people. Millions more have witnessed comparable results obtained on numerous television shows all over the country. I have appeared and demonstrated three times on Cable Network News alone which can be seen all over the world. This fact is especially

important for those who are aware that too many scientists, including famous social scientists, have been exposed as cheating on their "scientific" findings.

The high degree of success achieved would not have been possible without an understanding of the condition of psychological reversal and how to overcome it. The presence of this state is what prevents patients from getting better or achieving success regardless of the problem or area of endeavor. The degree of success is somewhat higher than reported in "Five Minute Phobia Cure" (85%) and this gain is due to some new discoveries in the realm of psychological reversal which has boosted the efficiency of the procedures since that book was written.

A question that I hear often is: "Does the treatment last?" The answer is that it does usually last but sometimes (less than 5% of the successful cases) it may not. Of course there is always a reason why it doesn't last. However, it is not a major effort to repeat the treatment.

As a result of my experiences on the radio, I now treat most of my psychotherapy clients by telephone.

PROBLEMS TREATED OVER THE RADIO

	Before	After	Time
Being on radio	8	2	5:25
Flying	10	1	3:20
Heights	5	1	4:50
Darkness	8	2	4:43
Talking on radio	6	1	4:15
Public speaking	9.5	3	7:10
Heights	9	4.5	3:36
Flying	5	1	4:28
Heights	7	1	3:58
Heights	5	1	2:05
Closed spaces	10	1	5:55
Snakes	10	2	8:12
Bridges	10	1	3:49
Flying	10	1	2:38
Needles	7	1	4:38
Diving	7	3	3:20
Freeway driving	9	3	5:27
Heights	10	2	4:10
Creepy crawlers	8	1	3:55
Public speaking	10	1	4:45
Over-eating anxiety	8.5	1.5	5:18
Making sales calls	10	1	3:55
Driving	10	1	4:25
Talking on radio	10	2	11:31
Escalators	10	4	5:12
Spiders	10	10	6:26
Public speaking	7	1	3:08
Public speaking	10	2	3:18
Flying	10	1	5:30
Getting a shot	10	1	3:35
Highway driving	10	1	3:23
Clothes over head	10	1	2:50
Flying in small planes	10	5	5:35
Elevators	10	2	2:36
Crowded cars	10	1	3:49
Being alone	8.5	1	2:32
Restaurant crowds	8.5	2.5	4:15
Driving	5	1	3:05
Sex	8	1	4:32
Feeling trapped	8	1	3:15
Grasshoppers	8	1	3:10
Being closed in	8	1	3:13
Snakes	10	1	2:46
Public speaking	8	1	3:24
Heights	8	1	2:39
Lust for brownies	7	1	3:01
Speaking on radio	9	1	3:40

Going down steps	7	1	4:05
Dying	9	2	4:38
Flying	10	4	4:15
Bees in closed space	9	8	6:49
Elevators	10	4	9:53
Dogs and cats	8	3.5	4:20
Speaking on radio	9	3.5	3:41
Flying	4	1	2:51
Flying	5.5	1	2:55
Creepy crawlers	6	1	2:32
Doctors	6.5	1	5:18
War trauma	9.5	4	4:37
Test anxiety	8	1	5:16
Love loss pain	6	1	4:18
Closed in	10	5	7:10
Lumber trucks	8.5	1	3:47
Talking on radio	10	3.5	6:28
Dogs	10	3	9:23
Shopping crowds	8	2	4:39
Having accident	5.5	1	5:30*
Bees, wasps, hornets	8	1	5:30*

*treated simultaneously

SUMMARY

Number treated: 69
 Successfully treated: 67
 Unsuccessful: 2
 Success rate: 97%

Average problem level before: 8.4
 Average problem level after: 1.8
 Average improvement: 6.6
 Average time for treatment: 4:34

My sincere thanks are due to Sam Muscovitz for analyzing the results of this study.

AN ATTEMPT TO QUANTIFY MUSCLE TESTING USING
MERIDIAN THERAPY/ACUPUNCTURE TECHNIQUES

by

John M. Corneal, D.C.

Randy Dick, M.S.

ABSTRACT

Clinical observations demonstrate the diagnostic significance of manual muscle testing. However correlations between manual muscle testing and mechanical test devices have proven elusive. This research study was conducted to observe the effects of acupuncture meridian sedation on muscle force and electromyographic activity as a basis for further quantification studies of manual muscle testing, and to investigate the theory of the organ-acupuncture-muscle relationship.

INTRODUCTION

Muscle testing is an integral part of a physical examination. It provides information that is useful in diagnosis, prognosis, and treatment of neuromuscular and musculoskeletal disorders. Muscle weakness may be due to nerve involvement, disuse, pain, or fatigue. The ability to palpate a particular muscle or its tendon, to distinguish between normal and atrophied contours and to recognize abnormalities of position of movement are important techniques in recognizing muscle weakness (Kendall and Kendall, 1972).

Kendall and Kendall's ideas have been expanded by Dr. George Goodheart to relate muscle function to the function of organs, glands, and acupuncture meridians. Acupuncture involves the movement of energy patterns within the body characterized by an electromagnetic effect and flow along 12 meridian pathways. Each meridian pathway relates to different muscle groups; the small intestines meridian, for example, controls energy flow in the quadriceps and abdominal muscle groups. There are points on each of the pathways which stimulate or sedate energy flow within the meridian when pressure is applied. Therefore, muscle function will vary with the energy flow along a meridian (Walther, 1976).

Purpose A major problem with the acceptance of manual muscle testing is the quantification of the effect. From ancient Chinese acupuncture to today's chiropractic techniques, successful functional diagnosis has not been

substantiated with scientific data. Thus, the acceptance of manual muscle testing and meridian therapy in today's society has been slow. This study will attempt to establish a quantifiable relationship between acupuncture energy meridians and individual muscle function. If successful, it will provide a scientific basis for further quantification of Dr. Goodheart's applied kinesiological approach to diagnosis.

REVIEW OF LITERATURE

Review of the following topics will be necessary with regard to this experiment.

Acupuncture/Meridian Therapy

Acupuncture is an ancient Chinese system of medicine dating back to the first writings about 200 BC (Hungdi Nerging Suwen, 1972). The acupuncture system consists of twelve meridians (Table 1). They flow over the entire body with no detectable anatomical pathway. Energy, called Chi (pronounce 'key'), is transferred through the system beginning in the lung meridian and flowing in a predictable fashion over a 24 hour period. Meridian therapy can affect this flow. Through the use of needles or acu-aids energy may be decreased or increased in a meridian, or transferred from one meridian to another (Mann, 1973).

One such meridian, the stomach meridian, begins below the pupil of the eye, flows down the front of the body and ends at the lateral proximal corner of the nail of the second toe (Figure 1). The sedation point for this meridian, referred to as S45, is at the end of the meridian on the second toe (Mann, 1973).

A clinical relationship has been established between the muscles of the body and the meridian system (Goodheart, 1964), (Walther, 1981). For example, a diseased organ will demonstrate muscle weakness in its associated muscle or muscles using manual muscle testing. Quantification of these changes have not been established.

Attempts to Quantify Manual Muscle Testing

Since 1975 several investigators have attempted to quantify changes in muscle function through the use of the Cybex II dynamometer (Nicholas 1976, 1980), (Smith, 1978), (Blaich, 1981), (Blaich and Mendenhall, 1984).

Table 1

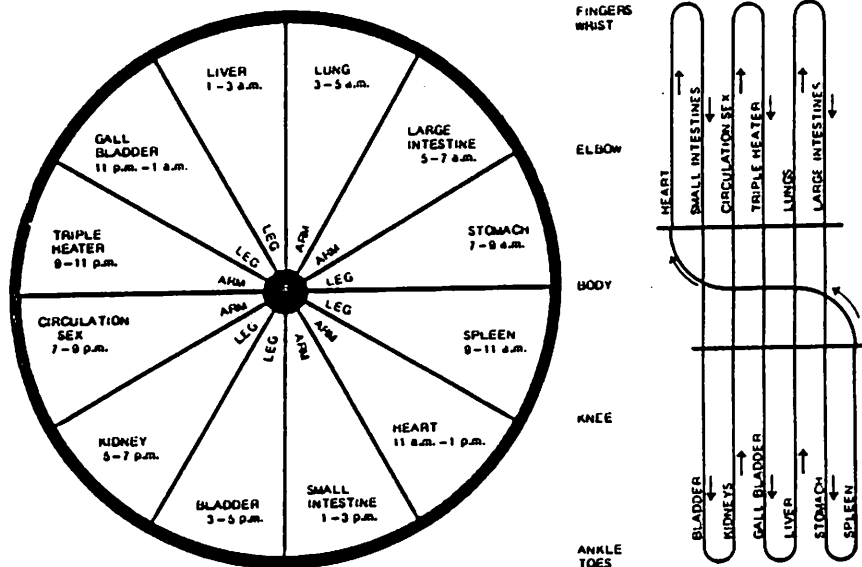
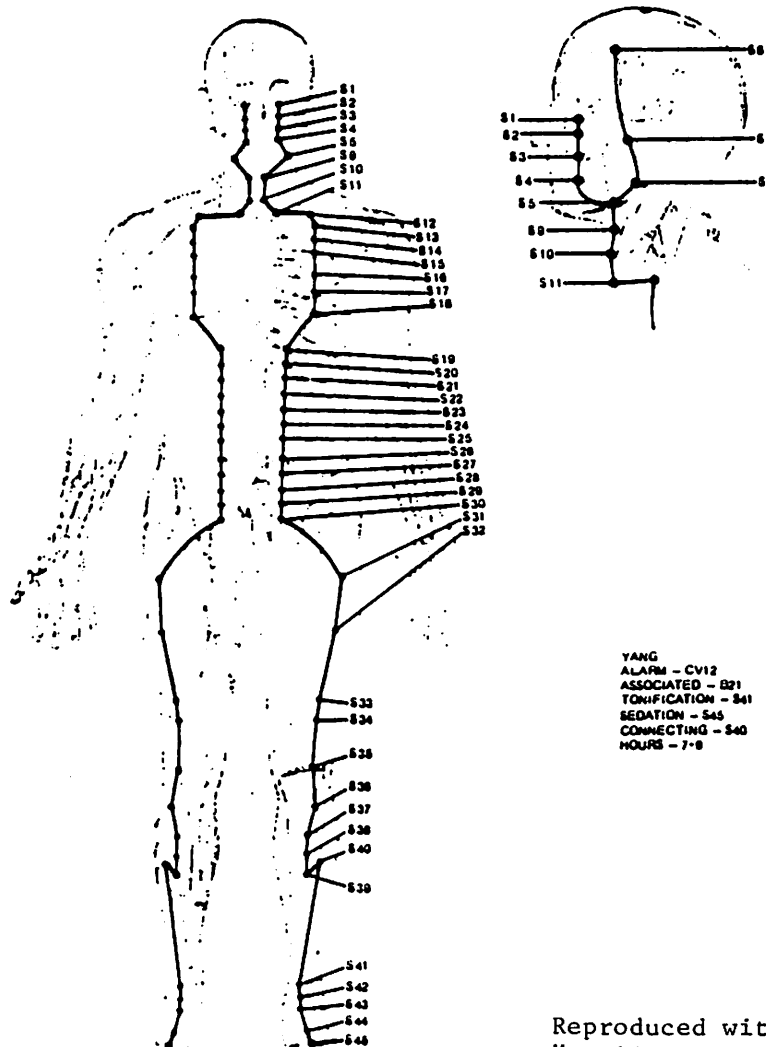


Figure 1



Reproduced with permission from "Applied Kinesiology-The Advanced Approach in Chiropractic" (Pueblo, CO: Systems DC, 1976).

In Blaich and Mendenhall's 1984 study, twenty subjects were selected for the test. They were divided into a test and control group each having ten subjects. The left deltoid, right bicep brachii, and right rectus femoris were evaluated by manual muscle testing. Each muscle was tested with the jaw in one of four positions. Subjects showing muscle weakness with a change in jaw position were placed in the experimental group. Those showing no change were used as a control.

Each subject performed a series of maximal contractions through the joints full range of motion in each of the four jaw positions. This sequence was repeated five times. Torque and EMG data was collected from the muscle tested.

The investigators concluded that there was no useful degree of correlation between any of the parameters evaluated during the Cybex machine muscle tests and the results of the manual muscle tests. No correlation coefficient was noted in the study. The degree of correlation found without regard to the control group were in line with the results of previous experiments according to the authors. Previous experimentation revealed that Cybex dynamometer testing failed to reveal muscular weakness in 60% of the patients who exhibited weakness with manual muscle testing.

Force and EMG

The assumption has been made that the force exerted by a muscle during contraction depends on the nervous excitation which is applied to it. Integrated or rectified EMG, which is a measure of such a level of excitation, can therefore be used as an indirect measurement of muscle force. This relationship is very attractive as it can give an inexpensive and noninvasive way to monitor muscle tension. However, if EMG is to be clinically useful, a precise relationship between a measure of EMG and a measure of muscle force must be developed which accounts for variables affecting reproducibility. Vredenburg and Rau (1973) have noted several parameters which may affect a reproducible EMG-force relationship: 1) the measurement method, including the position of the limbs to be measured; 2) the length of the muscle at which data are obtained; 3) the number of muscles involved and their relative positions with respect to the joint; 4) the position of the electrodes with respect to the muscle; 5) variations in the resistance between the skin and the electrode and 6) the effects of fatigue.

Many studies have evaluated EMG and muscle function but there appear to be more differences between studies than similarities. Lippold (1952), for example, reported a linear relationship between EMG amplitude and tension in the calf muscles of man while Zuniga and Simons (1969) and Vredenburg and Rau (1973) found a non-linear relationship between tension and EMG in the elbow flexors. These contradictions are not due simply to the testing of different muscles; contrary results have been reported on specific muscles such as the biceps brachii. Since the force of a single muscle is difficult to measure directly in man, most studies involve torques around the joint of rotation. These torques, however, may involve synergistic muscle actions on the same joint which contribute to force-EMG variability. Therefore, the techniques used to compare force and EMG may be more complex than the actual relationship itself.

Fatigue and EMG

Muscle fatigue may be caused by a complex combination of energy depletion, ischemia, and motor unit fatigue. Basmajian (1978) reported that early studies often found increasing fatigue produced with prolonged voluntary contraction was accompanied by a reduction of EMG potentials. However, many of those results were exaggerated by ischemia. Easen (1960), found that the amplitude of integrated EMG increased with time in a sustained isometric contraction with surface electrodes over the flexor digitorum superficialis. Energy depletion or ischemia were not reported as sources of fatigue in his study. Fatigue from multiple repetitions of brief maximum bursts may produce the same EMG effects but no studies were found to verify this hypothesis.

METHODS

Four subjects were tested for maximal isometric elbow flexion with and without a sedation of the stomach meridian which controlled the biceps brachii and brachioradialis muscles. The tested right forearm was in a supinated position with an elbow angle of 105 relative to the upper arm. This position was described by both Kendall and Kendall (1972) and Walther (1981) as desirable for testing the function of the biceps brachii. Force produced, biceps EMG, and triceps EMG were recorded from each subject.

Subjects

Three males and one female were used as subjects. The mean subject age was 31 years. No history of arm problems were reported. All subjects considered themselves right-handed.

Materials

1) Elbow flexion was conducted on an isometric test apparatus (Figure 2) secured to a table. The padded force cuff was adjustable up and down the lever arm (D). The lever arm angle with respect to the horizontal was also adjustable. In this experiment, the lever arm (and elbow) angle was maintained at 105 relative to the upper arm. The axis of rotation was connected to a load cell by a 24 cm. moment arm which applied a normal force to the gauge.

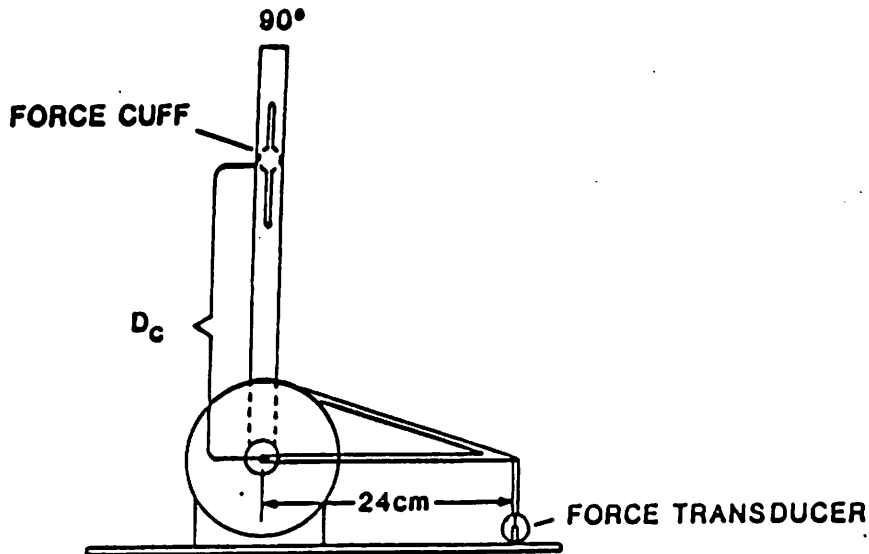


Figure 2. Test apparatus for static strength laboratory.

- 2) The load cell was connected to a Daytronics Model 300D amplifier.
- 3) EMG was collected through silver - silver chloride electrodes connected to a preamplifier.
- 4) Load and EMG signals were filtered, amplified, and prepared for use on a PDP 11/34 computer by a LPS A-D converter.
- 5) The filtered, amplified signals were also run through a Techtronix time base oscilloscope for observation.
- 6) Data was collected on the PDP 11/34 computer system and displayed on a Megatek printer.
- 7) A chrome plated steel sphere Acu-Aid of 1.2 mm. diameter was used in the test condition.

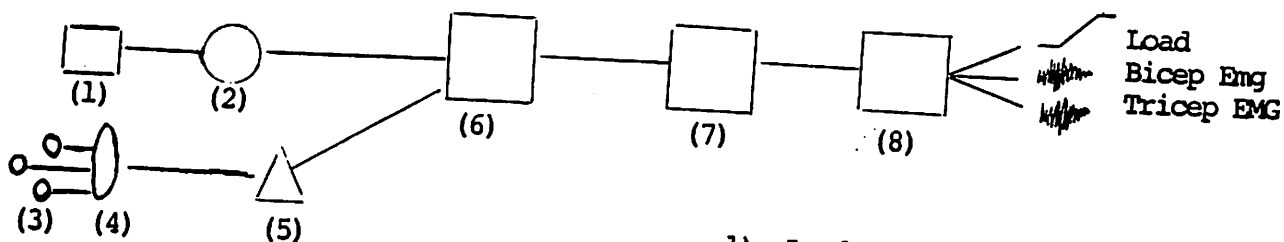


Figure 3. Sampling Set-up

- 1) Load cell
- 2) Daytronics Amplifier
- 3) Silver-Silver Chloride Electrodes
- 4) Preamplifier
- 5) Filter, Amplifier
- 6) Oscilloscope
- 7) PDP 11/34, LPS A-D Converter
- 8) Megatek

Test Conditions

Each subject performed three isometric flexions in each of two conditions:

- 1) an Acu - Aid taped to the sedation point (S-45) on the proximal lateral corner of the second nail of the right foot. (Fig. 4).
- 2) a placebo (tape) applied to the same location.

Subjects were unable to distinguish between conditions. The conditions were randomized over the six trials to avoid order effects. A four to five minute rest interval separated each trial during which time the collected data was viewed on the Megatek.



Figure 4. Location of Sedation Point (S-45)

PROCEDURES

EMG - Three silver - silver chloride electrodes were applied to the belly of both the bicep and tricep muscles after the skin was lightly sandpapered and cleaned with alcohol. The electrodes were applied equidistant apart along the assumed path of the muscle fibres (Kendall and Kendall, 1972).

Positioning - The test apparatus was adjusted so that the upper arm was parallel to the floor when the subject was seated erect in a posture constant chair. The lever arm was set at 105 and the right arm was inserted into the rest apparatus. The force cuff was adjusted so that it contacted the arm at the wrist. The chair slid under the table so the subject's chest was flush against the table with the upper arm perpendicular to the table edge. Feet were flat on the floor and the left arm lightly gripped the table to the left of the test apparatus. Additional stability was provided by a waist seatbelt on the chair.

Sampling - The subject was instructed to perform a four second maximal flexion beginning on a count of three. To prevent synergistic muscle contributions, the subject was instructed to keep the feet flat on the floor, the elbow forward against the lever arm pad, the chest flush against the table, the head up, and the eyes open. One investigator watched the posture during each trial. The second investigator began sampling load and EMG signals on the second of three counts in order to record a baseline. Each signal was sampled at a frequency of 400 Hz.

Rest - The subject was allowed to release the arm from the test device during the four to five minute rest period but was not released from the seat harness. One investigator removed the tape (and possible Acu-Aid) from the right second toe and then applied the next condition while the second investigator viewed the data on the Megatek.

Data Analysis - Data was displayed on three channels of the Megatek. The force signal was converted to newtons and the EMG signal was converted to microvolts from previous calibration. All signals were autoscaled and the EMG signals were rectified and time reset averaged with a bin size of 20 after the baseline of the raw EMG signals had been estimated. A hard copy of force, biceps EMG, and triceps EMG was obtained from each trial. The actual rectified time reset average for each bin of bicep and tricep EMG was also obtained from each trial for further analysis.

RESULTS

Force - The maximum load over the four second sampling period was recorded by the software display program SCOP for each trial. The three Acu-Aid and three placebo values were then separated and averaged to yield one Acu-Aid and one placebo value for each subject. Means for the four subjects are shown in Table 2. The same data are plotted in Fig. 5. Individual trial values for each subject are shown in Appendix A.

Table 2

<u>Subject</u>	<u>Condition</u>	<u>Force (N)</u>
1	A	83.7
	P	86.7
2	A	126.1
	P	134.1
3	A	107.4
	P	115.2
4	A	151.6
	P	160.0

Mean Isometric Biceps Flexion Force Produced in
Acu-Aid (A) and Placebo (P) conditions in 4 Subjects

EMG - Rectified time reset averaged bicep and tricep EMG were examined over a one second interval beginning two seconds into the muscle action. This interval corresponded best with peak force production. Twenty bins of rectified averaged EMG were again averaged to produce a mean rectified EMG for the one second interval. The three Acu-Aid and three placebo conditions were then separated and averaged as described previously. Bicep EMG means for each subject are shown in Table 3. The same data is plotted in Fig. 6. Tricep EMG means for each subject are shown in Table 4. Individual trial bicep EMGs are shown in Appendix A.

Table 3

<u>Subject</u>	<u>Condition</u>	<u>EMG (mV)</u>
1	A	202
	P	131
2	A	351
	P	375
3	A	111
	P	134
4	A	520
	P	413

Mean Isometric Biceps Flexion EMG Produced in
Acu-Aid (A) and Placebo (P) Conditions in 4
Subjects

Fatigue Effects - The data was examined for the effects of fatigue through the six trials. Force, bicep EMG, and tricep EMG were averaged across subjects regardless of the condition for each trial. This approach was justified by the randomization of condition assignments. Figure 7 shows the results of averaging the forces across subjects for each trial.

Statistical Analysis - To test the hypothesis that the means were in the predicted direction, a binomial test was performed on the data in Tables 2, 3, and 4. Theory suggests that:

- 1) The force output will be reduced when the meridian is sedated.
- 2) The bicep EMG will be reduced when the meridian is sedated.
- 3) The tricep EMG will not change when the bicep meridian is sedated.

Since the chance probability of the means being in the predicted direction is .5, the appropriate form of the binomial is:

$$b(k:m,p)$$

Where:

- k = number of successful predictions
- m = number of predictions
- p = chance probability

The binomial probability, b, then becomes

$$\begin{aligned} & b(8:12, .5) \\ & = \binom{12}{8} .5^8 .5^4 \\ & = .022 \end{aligned}$$

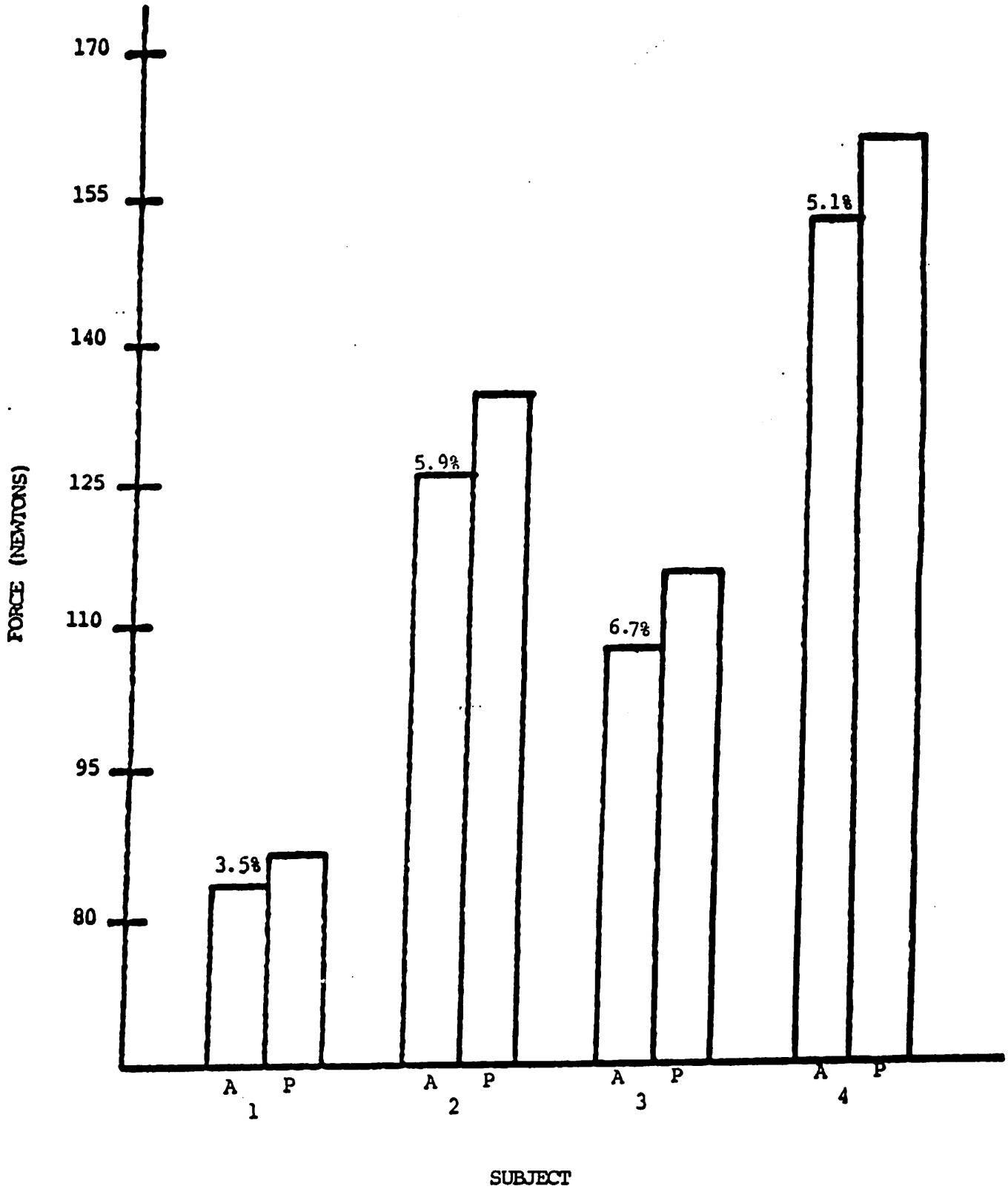
As a result the probability that so many successful predictions were made by chance is less than $p=.05$ supporting the hypothesis. (Feller 1968)

Table 4

<u>Subject</u>	<u>Condition</u>	<u>EMG (mV)</u>
1	A	46
	P	49
2	A	72
	P	72
3	A	18
	P	17
4	A	18
	P	18

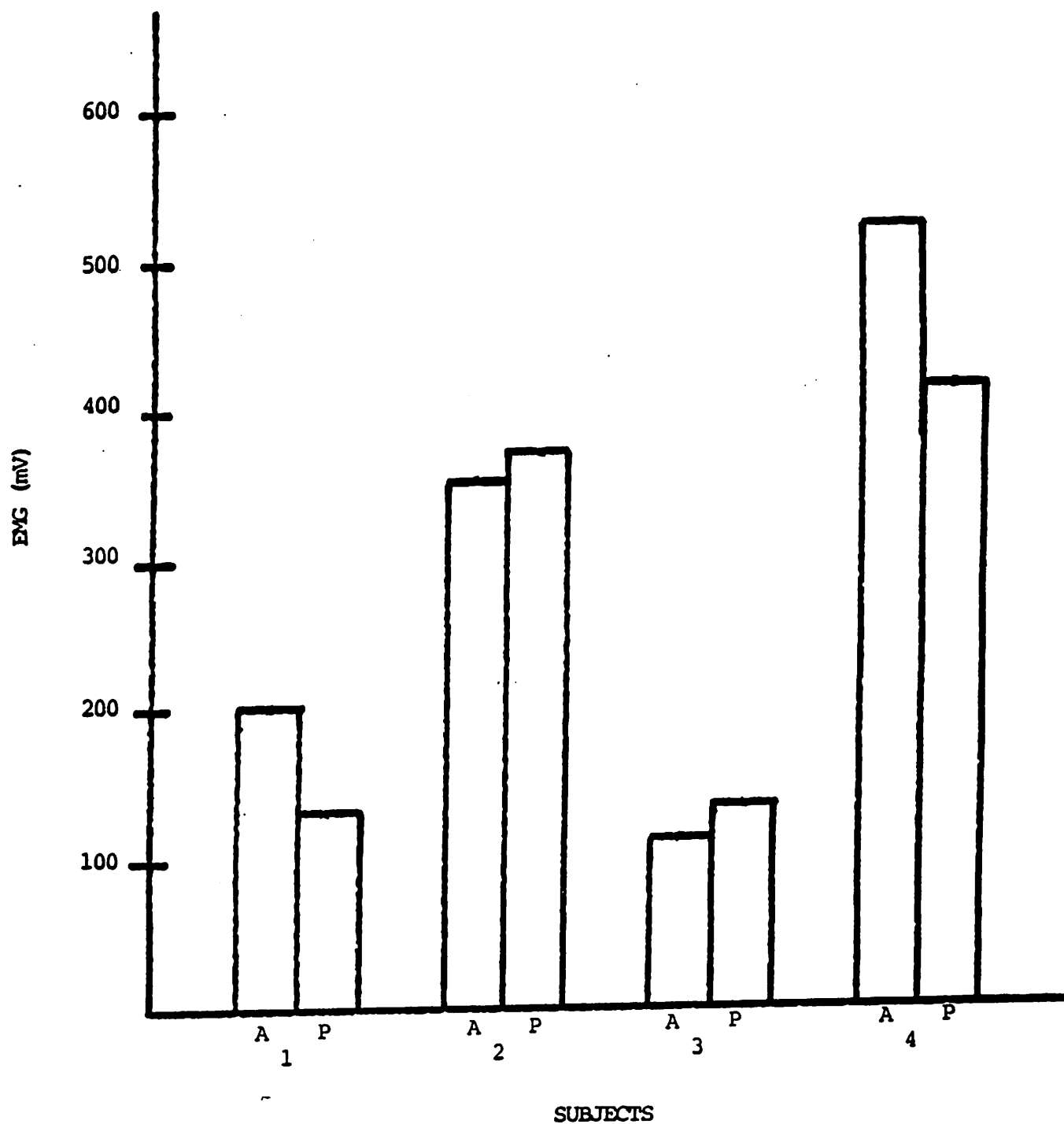
Antagonist Tricep EMG during Isometric Biceps Flexion
in Acu-Aid (A) and Placebo (P) Conditions in 4 Subjects

Figure 5



Mean Isometric Biceps Flexion Force produced in Acu-Aid (A)
and Placebo (P) conditions in four subjects

FIGURE 6



Mean Isometric Biceps Flexion EMG produced in Acu-Aid (A) and Placebo (P) conditions in four subjects

Figure 7

<u>Trial</u>	<u>Condition</u>	<u>Force (N)</u>
1	1A, 3P	127.9
2	2A, 2P	124.1
3	2A, 2P	124.0
4	1A, 3P	116.3
5	4A, 0P	115.2
6	2A, 2P	116.1

Isometric Bicep Flexion Force Averaged Across Subjects
for Six Trials

Figure 8

<u>Trial</u>	<u>Condition</u>	<u>EMG (mV)</u>
1	1A, 3P	290
2	2A, 2A	267
3	2A, 2P	316
4	1A, 3P	268
5	4A, 0P	264
6	2A, 2P	271

Isometric Biceps Flexion EMG Averaged Across Subjects
for Six Trials

Figure 9

<u>Trials</u>	<u>Condition</u>	<u>EMG (mV)</u>
1	1A, 3P	36
2	2A, 2P	40
3	2A, 2P	37
4	1A, 3P	36
5	4A, 0P	42
6	2A, 2P	42

Antagonistic Triceps EMG Averaged Across Subjects

DISCUSSION

Force - Subjects averaged 5.3% less force produced with an applied Acu-Aid than with the placebo. It was noted that the variability for the placebo condition was generally much larger than the Acu-Aid condition for both force and EMG. The force variability, surprisingly, seemed related to fatigue (Fig. 7). There was almost a 10% drop in force produced from trial 1 to trial 6 averaged across subjects, despite more than the minimum suggested rest interval of 2 minutes between isometric strength test trials noted by Chaffin (1984). Posture adjustments could have also contributed to this drop, although each trial was observed carefully by an investigator. An increased number of trials with each condition may have reduced this variability.

EMG - Averaged rectified bicep EMG between conditions showed no apparent condition effect, with two subjects showing higher biceps EMG with the Acu-Aid and two showing higher EMG with the placebo. Therefore the conclusion may be made that the Acu-Aid has no effect on EMG sedation. It may be argued, however, that the meridian therapy effect may not be detectable by EMG.

Several cited studies have examined force EMG relationships. As noted in the literature review, several factors may have influenced these relationships including electrode placement, synergistic recruitment, and fatigue. In this study, electrode placement between conditions was the same for each subject, the meridian being sedated included both the biceps brachii and brachioradialis muscles. Therefore, EMG effects due to the variables of electrode placement and synergistic contribution were the same in each condition. Muscle fatigue in a sustained isometric contraction has been shown to be accompanied by increased rectified EMG (Vredenburg and Rau, 1973), (Eason, 1960). However, in this study, if fatigue was responsible for the decline in force production over trials, it was not reflected by an increase in biceps EMG (Fig 8).

The antagonistic tricep EMG remained stable across conditions and was generally 10 times lower in magnitude than the biceps EMG. The sedated meridian did not affect the triceps muscle, so one did not expect to see a change across conditions.

Until this study, the area of acupuncture/meridian therapy has produced no quantifiable studies related to its effect on muscle function, yet successful results of this therapy have been reported for centuries. This study demonstrates that a relationship between meridian energy and muscle function does exist. By demonstrating a consistent reduction in force output under sedation the study further establishes a means to control muscle function in future studies of manual muscle testing.

In summary, sedation of the stomach meridian involving the bicep brachii reflected a significant reduction in bicep force production as measured in an isometric elbow flexion. Bicep EMG demonstrated no relationship to the stomach meridian sedation, while the antagonist tricep EMG activity remained stable across both conditions.

APPENDIX A

<u>Subject</u>	<u>Trial</u>	<u>Condition</u>	<u>Force (N)</u>	<u>Bicep EMG</u>	<u>Tricep EMG</u>
<u>1</u>	1	A	87.3	232	44
	2	P	90.7	121	58
	3	A	86.3	203	43
	4	P	88.0	177	33
	5	A	77.5	170	51
	6	P	81.4	95	56
 <u>Subject</u> <u>2</u>					
	1	P	150.4	449	71
	2	A	128.3	477	58
	3	P	124.4	372	67
	4	P	127.6	304	78
	5	A	126.3	265	80
	6	A	123.7	311	79
 <u>Subject</u> <u>3</u>					
	1	P	105.8	78	15
	2	A	105.1	103	18
	3	P	124.7	174	17
	4	A	110.2	123	18
	5	A	106.9	106	18
	6	P	115.0	151	18

APPENDIX A (Cont.)

<u>Subject</u>	<u>Trial</u>	<u>Condition</u>	<u>Force (N)</u>	<u>Bicep EMG</u>	<u>Tricep EMG</u>
4	1	P	168.1	403	15
	2	P	172.2	368	25
	3	A	160.5	517	21
	4	P	139.3	469	15
	5	A	150.0	517	18
	6	A	144.3	527	15

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NUTRITION AND CHIROPRACTIC MERIDIAN ADJUSTING

By Dr. Elmer J. Cousineau, D.C.

ABSTRACT:

To discuss the use of Chiropractic Meridian Adjusting as a means of stopping the energy leak, instead of resupplying the energy with nutrition.

Introduction:

The use of nutritional supplements as a support to increase the strength of muscle functioning is a documented fact in the published papers of the International College of Applied Kinesiology. (1)

The use of a multi-vitamin and multi-mineral has been demonstrated as non-therapeutic in the strengthening of a weak muscle when compared to its corresponding muscle on the other side of the patient's body. Whereas the multi-vitamin failed to increase the strength of the weak muscle, the increased dosage of the therapeutic tablet would accomplish this goal. (2)

The use of Vitamin E in a therapeutic dosage was specific in the strengthening of the gluteus medius and piriformis muscles, but it took a therapeutic dosage of Vitamin C to strengthen a weak lower trapezius muscle. Thus it was demonstrated to Applied Kinesiologists the specificity of the vitamins and minerals in the strengthening of weakened muscles. (3)

The Stress Syndrome:

When the Stress Syndrome was introduced by Dr. Hans Selye M.D. of Canada, Vitamin C was found to be used by the body in large amounts, varying with the degree of stress experienced by the patient. Some nutritionists even used Vitamin C in dosages as high as in grams daily to combat the loss due to stress. (4)

Since Vitamin C was specific for the lower trapezius muscle which was supplied by the energy of the Spleen Meridian, this led to the discovery by this author that the adjustment of the patient's Twelfth Thoracic Vertebra would reduce the need for such large amounts of Vitamin C. The Twelfth Thoracic is the Associated Vertebra for the Spleen Meridian. (5)

The overfunctioning of the Spleen in attempting to cope with the environmental stress that the patient's body was experiencing used up the daily supply of the patient's Vitamin C and weakened the lower trapezius muscle. Thus was created the need for the increased supply

The Twelfth Thoracic Vertebra:

In my experience, I found that turning ON the Spleen Meridian by adjusting its Associated Vertebra, the Twelfth Thoracic, was a quicker way of preventing further loss of the energy than by the addition of Vitamin C. (6)

The restoration of proper functioning of the Spleen which was

responsible for the energy loss was preferable to the addition of gross amounts of Vitamin C.

The adjustment of the Associated Vertebrae is like fine-tuning the body, similar to fine-tuning an automobile engine to prevent it from wasting its fuel.

The use of supplements in therapeutic quantities was not in error, as such, but this supplementation obviated the possibility of locating the cause of the energy drain.

The Emotional Energy Drain:

By asking questions of the patient while testing a strong indicator muscle, the ensuing weakness indicated areas of emotional distress to the patient. (7) These distressing emotions caused an increased consumption or usage of the stress vitamins and nutrients.

The questions asked were regarding the patient's views regarding certain aspects of their environment.

The Material Possessions:

Those situations in the patient's environment involving material things that were not to the patient's liking, would cause distress and weakening of muscles on the Stomach Meridian. (8)

Among the many muscles sharing the energy of the Stomach

Meridian are the Clavicular Branch of the Pectoralis Major, the Anterior Neck Flexors (consisting of the Scalenes and the Sternocleidomastoideus), and the Biceps Brachii and the Levator Scapuli, to name a few. Adjustments of the Stomach Meridian's Associated Vertebra, the First Lumbar, restores strength to all of these muscles, regardless of which are weak.

People's Behavior Patterns:

Those situations in the patient's environment, that had to do with the unacceptable behavior patterns of other people, would drain energy from the Gall Bladder Meridian and its associated muscles, the popliteus muscle of the knee and the anterior deltoid of the shoulder girdle. Adjustment of its associated vertebra, the Eleventh Thoracic, would balance this meridian and strengthen both the popliteus and the anterior deltoid muscles.(9)

The Hypoglycemic Reaction (The No GO Syndrome):

When effort by the patient was needed to change certain aspects or conditions of their environment, and the patient was reluctant to exert themselves, this would depress the amount of available blood sugar necessary to carry out the desired change. This condition is known as Hypo-glycemia.(10)

This is much the same as taking one's foot off the accelerator pedal of an automobile results in slowing the motion of the car. No Gas, No Go, No Change. The patient unknowingly, was actually controlling this hypo-glycemia, or Low Blood Sugar.

The adjustment of the **Fifth Cervical Vertebra** for anteriority on the left, would correct this unbalance. The patient could still overload this circuit again emotionally. (10)

The Hyper-glycemic (No-Win Syndrome):

When the situation was so unfair as to be distressful, it would provoke the patient to exert themselves to such an extent as to cause the continued secretion of **adrenalin** which would make blood sugar available in such large quantities as to cause a **High Blood Sugar** condition. (11)

The patient's inability to change the condition, despite repeated efforts, produced a No-Win situation for the patient and the continued effort could produce the High Blood Sugar levels known as **diabetes**. Thus, diabetes could be produced by a No-Win situation in the patient's environment.

The muscles weakened by this overload would be the bilateral lower trapezius, when tested simultaneously, and the right leg raise, when the supine patient flexes the left leg at the knee.

The adjustment of the **Ninth Thoracic Vertebra**, as the Associated Vertebra for the **Pancreas**, would eliminate this unbalance and restore strength to those muscles weakened by the overuse of the **Pancreas** of the **Spleen Meridian**. (12)

The Adrenal Overload:

The persistent effort by the patient to overcome the No-Win situation requiring the continued secretion of adrenalin, could exhaust the adrenals, and weaken the sartorius-gracilis and the gastrocnemius-soleus muscles supplied by this meridian.

The adjustment of the Second Lumbar, as the associated vertebra for the Triple-Warmer Meridian, corrects this unbalance and restores strength to these weakened muscles. (13)

Summary:

Nutritional supplements were used by Applied Kinesiologists to assist in the strengthening of weakened muscles of the body and to improve the functioning of bodily organs.

These nutritional supplements have been demonstrated as being very specific in the strengthening of certain muscles when the proper nutrient or vitamin had been given in sufficient strength, known as a therapeutic dosage.

However, the use of the nutritional supplements prevented the discovery of the energy loss that was causing the muscles to weaken, namely the Emotional Drain.

As each person's body attempts to compensate or adapt to environmental distresses, (as in the Stress Syndrome of Dr. Selye), it uses up valuable energy that would be available for other more important uses of the patient's GOAL-SEEKING MECHANISM.

This over working of the bodily organs causes the circuit's breaker-switch, the Associated Vertebra, to go to "OFF" position, thereby weakening the muscles on that circuit.

The adjustment of the Associated Vertebra of the involved or unbalanced meridian allows the return of full strength immediately to every muscle on that meridian.

The adjustment of the Associated Vertebra as an initial item in the treatment may obviate the subsequent other treatments that have been used in the past.

Those meridians most frequently involved in the Stress Syndrome and their Associated Vertebrae are:

The Pancreas Meridian	Ninth Thoracic
The Gall Bladder Meridian	Eleventh Thoracic
The Stomach Meridian	First Lumbar
The Adrenal Meridian	Second Lumbar

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Holographic Diagnostic Procedure

By Edward E. Evans D.C.

Abstract: A method of two point therapy localization to evaluate organ and glandular function.

After the January 1987 meeting in Key West Florida, I started to test alarm points with eyes opened and closed. Dr. Goodheart had presented his Neuropeptidal Enteric Holographic Technique* and I was surprised at the number of people who tested positive. I found that some patients should have tested positive where negative to T.L. of the small intestine alarm point with eyes opened or closed. I decided to try a two point T.L. from the alarm point to the corresponding pulse point. The majority of patients then tested positive. I continued to test all alarm points to corresponding pulse points. I found this procedure to be very helpful in evaluating organ and glandular function. I then decided to find if there was a Holographic spinal subluxation for each T.L. Using the fourth thoracic as a starting point because of its relation to the small intestine, I tried to apply Tibetan acupuncture principles to the spine. Tibetans have three major meridians, the right stomach meridian which they say crosses over above the pubic and goes to the second toe of the left foot, the left stomach meridian which crosses over and ends on the second toe of the right foot. The right one is called Bowel, the left one Lymph or Phlem. The third are the Governing and Conception vessels, called Wind.

I found that most Holographic subluxations related to digestive function were on the right side of the spine. Holographic subluxations related to glandular function, infection and inflammation were mostly on the left side of the spine. Strong emotional input seems to involve the Conception and Governing vessels and would challenge as a bilateral Holographic subluxation at the related level.

Procedure:

1. Therapy localize the alarm point. If negative, two point T.L. to the pulse point associated with the alarm point and retest.
2. Make sure patient is not holding breath in and avoids clenching the teeth.
3. Test with eyes open and closed. Most functional problems will T.L. with eyes closed. Active inflammations seem to T.L. with eyes open more often.

Treatment Procedure:

When challenging the vertebra level associated with the positive T.L. to alarm and pulse points, have the patients eyes opposite of supine positive T.L. Correct Holographic subluxation on phase of respiration which neutralized the challenge.

Holographic Subluxations Listing

Atlas-Large Intestine and Adrenals-left or right
Axis-Glandular-left or right
6th Cervical-Thymus-left
1st Thoracic-Thyroid
2nd Thoracic-Heart
3rd Thoracic-Lungs
4th Thoracic-Small Intestines
5th Thoracic-Gall Bladder
6th Thoracic-Liver
7th Thoracic-Pancreas-right-digestive, left-insulin
8th Thoracic-Stomach-left or right
1st Lumbar-I.C.V.-right
2nd Lumbar-I.C.V.-right
3rd Lumbar-Large Intestine and C.I.C.V.
4th Lumbar-Uterus, Ovaries, Prostate and Gonads-mainly on left
5th Lumbar-Adrenals-left, Large Intestine-right
Sacral-Bladder-left, Vales of Huston-right

PSYCHOLOGICAL OVERLOAD CHALLENGE

Fatah R. Evans, D.C.

ABSTRACT

It has been observed that by exceeding one's normal physical activities (such as athletic training and endurance events), the added neurological demand may create cranial faults which, when corrected, enhance the individual's future performance. This paper discusses an approach of challenging an individual's mental and emotional perspective and this additional neurological stress creates cranial faults. The concept presented is that when the cranial faults are corrected under these circumstances (as in the physical challenges), this will enhance the individual's mental and emotional performance.

INTRODUCTION

Several years ago while trekking in the Himalayas, I was introduced to the idea of pushing the physical body to an extreme stress and then coming below that stress in order to recover and repair. In that particular situation, if we were to set camp at 15,000 feet, we would hike up to 15,500 or 16,000 feet then return to our camp at 15,000 feet. We would stay for a couple of days at this camp but would take small hikes to higher elevations. Likewise, when we set camp at 16,000 feet, we would go higher to 16,500 or 17,000 feet, and so on. The body was being physically pushed beyond its normal function, in this case the altitude and oxygen debt. After rest and recovery, the body would adapt and was better able to handle the altitude.

During this trek, I had treated several other trekkers who were suffering from altitude sickness. Their initial subjective complaints were usually nausea and frontal headache. The obvious and rational approach is to descend; however, when a person experiences the nausea and headache, his inclination is simply to lie down. On examination of these individuals, there were cer-

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tain common structural findings, such as Inspiration Assist cranial faults, Temporal Bulge, and upper cervical subluxations or fixations. Their subjective complaints were easily reduced shortly after correction of my findings. This then would allow them to descend somewhat comfortably. Though I had no objective measurement to record changes, such as vital capacity or blood pressure, the changes in attitude were quite noticeable. Prior to treatment most of the individuals did not want to get up and move, but after treatment they felt comfortable and were able to gather their gear and descend to a lower altitude and rest.

In April of 1985 I attended a fine seminar in Aspen, Colorado presented by Robert Blaich, D.C. The seminar focused on performance enhancement. Dr. Blaich talked about the changes in performance of a cyclist he treated as staff chiropractor for the Coors International Bicycle Classic. As Bob treated these athletes and brought them further into balance, he noticed that when he treated them after a race they improved their performance in the next day's race and they felt better after the race. This is remarkable considering the fact that the daily races may be 120 miles and may include elevation changes.

During the particular seminar mentioned above, the participants used speed reading as the performance to be challenged. Each doctor paired off with another and they checked each other for switching by using therapy localization of both K27s and crossed hands K27s and by using respiratory challenge. We treated as was appropriate to our findings. We then determined our own reading capacity and proceeded with some basic speed reading techniques and then retested ourselves to see if the circuits were blown; i.e. to check if the stress of the speed reading created a reaction that would show a positive TL or challenge to K27s. If so, we would fix what we found and quite often this was a mastoid inspiration assist. When we would read at our normal speed, it felt quite uncomfortable. Then, as we progressed with more demanding speed reading techniques, we would again check each

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other and treat as needed. The results for most of the participants were quite remarkable. I personally was able to go from 250 words per minute with fair comprehension to 675 words per minute with fair comprehension during that weekend.

This procedure that Dr. Blaich presented reminded me of my experience in Nepal. The similarity that I saw was that in both cases people were pushed beyond their normal capacities (the body's ability to perform at high altitude and the ability to perform reading at an increased rate), which then created neurological stress and adaptation. As a result of the physiological overload, we found upon examination various cranial and cervical faults. Upon treatment, the individuals were better able to perform under those same or more demanding conditions.

DISCUSSION

As mentioned above, when the physical demand exceeded normal activities, the body in its response to the stress created physiological checks and balances which, upon examination, revealed switching patterns as evidenced by positive TL and/or challenge of K27s. Treatment of these faults as mentioned in the examples allowed the individual to perform normally or better than before the stress.

- High altitude treatment reduced the symptom complex and allowed individuals to function better.
- Cyclists improved performance and felt better after the demanding event.
- Seminar participants quickly responded with improved reading rates.

The concept of this presentation is that if we can challenge an individual mentally/emotionally beyond his or her normal outlook, the added stress will create structural reactions such as cranial faults and when corrected, this then may neurologically enhance the individual's capacity to deal with mental/emotional stress.

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PROCEDURE

First, test a strong indicator muscle and proceed with therapy localization of both K27s and challenge with various respiratory patterns. TL crossed hands to K27s with respiratory challenge as well. If there are any positive findings, treat accordingly.

The patients selected by me were average people with average problems. We all have to deal with finances, whether paying personal or business bills, loans, balancing the budget--making ends meet. We have our ups and downs in our relationships: spouse, children, relatives, in-laws, co-workers, etc. Some people are overcoming injury or illness. Some people are students or are in the midst of changing occupations. These are things we all deal with. They are life's normal demands and somehow we balance things out. The key here is that this procedure is used with normal people, not patients with obvious psychological problems or depression.

When approaching patients for this test and the treatment, I have briefed them on the concept of overload as described in the introduction. If they grasp that understanding, I then instruct them that I will be asking them to look at all the current demands in their lives, BUT all at once. It will be negative momentarily, but we will then put it in its proper and positive perspective. I ask them then to hold all of what I say as if on a computer screen--outline all of this: relationships (spouse, lover, relatives, children, employer, employees, etc.), finances (I described the possibilities), physical problems, work problems, upcoming exams or deadlines, and anything else that they can think of. It is obvious that when we see all we are dealing with in our lives (and see all of it at once) it is overwhelming. However, at this moment I tell the patients to let all of that go and remind them that although what was described is what they deal with, it is not the reality. The reality is more positive.

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Everything mentioned is more or less what we all deal with in our lives and we all manage quite well. This is the moment to reflect on the more positive aspects of what was mentioned and that is, that all of life's demands are being taken care of--they are in process. The budget gets balanced, the patients love their spouse and their children, their work is a pleasant challenge, they are recovering from their injury, and so on. Patients will usually acknowledge this and feel pleased.

Now recheck the strong indicator muscle and retherapy localize K27s as before. If there is a positive TL then challenge with different phases of respiration and treat accordingly.

Now, I am ever aware of Dr. Goodheart's challenge to us all that when we find some new research material to present we should be able to measurably observe the changes, those other than muscle testing changes. In light of this I did not see how, in regards to the concepts presented, I could realistically measure any change in a person's mental and emotional status other than his or her subjective comments.

I find it interesting that one of the most demonstrable and measurable changes that we see using a variety of Applied Kinesiological procedures is the change in range of motion, especially with leg abduction. Though I had seen changes in range of motion with this procedure, I had not documented them. Therefore, twenty patients were recently randomly selected and tested as described, in order to document the frequency of change in range of motion. All twenty patients had a positive reaction to the challenge and all required mastoid inspiration assist for their correction. Eighteen of the twenty had very noticeable increases in range of motion (leg abduction) and two remained the same.

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PROCEDURE SUMMARY

- Test with strong indicator muscle in clear
- Patient TL's K27s, challenge with different phases of respiration
- TL K27 crossed hands, with respiratory challenge
- Correct any findings as necessary
- Measure leg abduction
- Instruct patient to overload mental/emotional circuits by actively reviewing all his or her normal life activities, such as relationships, finances, etc.
- Reinforce positive perspective of his or her life
- Recheck indicator muscle, then recheck K27s as before
- Challenge positive findings with different phases of respiration
- Treat accordingly
- Recheck leg abduction

CONCLUSION

This paper presentation demonstrates again the Body-Mind connection of which we are all aware. This is seen in the fairly consistent change in range of motion. However, the concept that this procedure will enhance a person's mental and emotional well being is still just that--a concept.

In order to excel in all the things that we do, whether physically, mentally or emotionally, we challenge our limits and train ourselves to exceed these limits. The physiological reaction created by these endeavors, when treated with specific Applied Kinesiological and Chiropractic procedures, increases the neurological response and recovery so that we are better able to handle the more challenging demands ahead of us in our lives.

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THE DURAL DEFENSE SYSTEM

Dr. Carl A. Ferreri

ABSTRACT

Man, and all the animal kingdom, was created with basic innate survival systems and, for the most part, should be able to survive without any outside administrations. The exceptions to this rule are obvious. It is within these survival systems that we find the answers to all of the problems that befall the human and animal condition. The primitive or innate survival systems of feeding, fight/flight, and reproduction have been recognized as the basic survival systems of all species. In the animal kingdom the fight/flight system becomes operational whenever a stressful situation is encountered. The necessity of protecting the central nervous system and its bony protective enclosure from damage is of first priority. To understand this mechanism more fully we must observe what happens when any animal is put in a dangerous or potentially dangerous situation. The jaws are clenched, the muscles are tensed, the skin and fascia contracts and, in the case of the animal, the tail is pulled down between the legs. What this all means and how it relates to health is the topic of this paper. Most of the information to be discussed comes from the author's observations and clinical experience and little is found in the literature.

INTRODUCTION

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Most of the therapeutics administered throughout the ages have addressed the effects and/or symptoms of a condition and not the causes of that condition. Of course, we are not talking of gross injury where outside help to dress a wound or put together a broken or torn part that may be essential to survival, but rather the aches, pains and dysfunctions, be they somatic or psychosomatic, in every day life. This is still the case regardless of the therapeutic discipline used. Why you have what you have and not the fact that you have it, is or should be the important issue. Unfortunately, almost all of the investigators have lost sight of the self healing, self maintainance and self protection survival features built into the body itself. Medicine and its subspecialties looks to chemicals and surgery, Chiropractic, looks, for the most part, only to the spine and now machines and diet and an assortment of others look to herbs, exercise, mental concepts, etc. as the necessary therapeutic modality for restoration of health. When all this fails to produce the desired results, new electronics seems to be the looked for answer. All these applications have had some benefit in some cases but none of these really address the main issue. Why do you have what you have.

THE DURAL DEFENSE SYSTEM

In the authors paper on the Temporo-Mandibular Joint, the jaw involvements were divided in four main areas for consideration. The first consideration was bilateral therapy localization of the T.M.J., using the gluteus medius muscle as the indicator muscle, with no jaw motion or other function. This fault, if found, was labeled the Universal Jaw. Just as with the Universal Cranial Fault, if this T.M.J. fault is found, a multitude of problems

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involving structural integrity of everything from the diaphragm down was at stress. This includes the pelvic floor muscles and their involvement in bed wetting, prostate and uterine problems, urine and bladder problems and a host of other problems. The next consideration was the T.M.J. involvement in the neurologic control of the sequencing of the digestive process and was designated the Digestive Jaw. Swallowing, stomach, small and large bowel function are specifically involved if there is a fault in the mechanism. The reactive muscle activity in this sequence relates to specific pelvic muscle stability as another important consideration of this T.M.J. function. The third consideration, the left T.M.J., using the opposite gluteus medius muscle, is the weight bearing or sacro-iliac fault of the cranial pelvis and through structural reactivity is most important in dealing with the chronic back problems seen both Chiropractors and Medical Practitioners alike.

The fourth classification, the Right Jaw Complex, originally designated as the emotional jaw has been reclassified, by the author, as the Defensive Jaw Complex, is, with its reactive coccygeal mechanism, the topic of this paper. This, as you will see, is most essential in basic survival as it is the primary mechanism in protecting the skull and more specifically the brain from injury. The coccygeal mechanism is responsible for the protection of the spine and the spinal cord from injury.

As was discussed earlier, when observing any animal, including man, when threatened, certain things always happen. First the jaw is clenched, activating the very powerful masseter muscles, causing a number of things to then happen. The teeth are locked together so that they are less likely to be damaged in the event of a blow to the face.

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The contraction of the masseter muscles initiate the contraction of the buccinator muscles. The buccinator muscles can be contracted independently but in this case there is an automatic response. In the animal the buccinator muscles are tightened to get the lips out of the way, exposing the teeth to frighten the enemy and also allow for use in defense. In man, however, the buccinator muscles are tightened across the teeth to further help protect them from injury.

The contraction of the masseter muscles initiate the contraction of the temporalis muscles. This is most important in establishing a proper defensive situation for survival. It must be remembered that we are dealing with primitive or innate response systems. Survival in the primitive setting is life or death. The response mechanism must deal with this grave possibility innately or automatically. It has been demonstrated in Applied Kinesiology that contraction of the right temporalis muscle activates an emotional filtering mechanism. When considering the possibility of life or death [non survival] the emotional response must not immobilize us by fear but must be a controlled response. The contraction of the right temporalis muscle does just that and at the same time control the increased adrenaline output. At the same time, under the fight/flight circumstance we may be physically injured. Applied Kinesiology investigation has shown the contraction of the left temporalis muscle activates a sensory input filter mechanism so that pain will not distract us from the business of survival at that time. We can deal with the pain later.

Examination of the skull and the cranial bones demonstrates two basic kinds of sutures or joint surfaces. There is a serrated interlock type of suture to which the dura is securely anchored and which actually becomes part of

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the periostium and an overlap slide type with no firm dural attachment. We find the latter on the sphenoid and temporal bones where they articulate with the frontal and parietal bones. This type of joint allows for greater respiratory motion in maintaining the various neurological and physiological functions of the skull. In examining these sutures it is apparent that they possess little structural integrity in the event of a blow to the skull. If they are separated past their normal physiological motion, unconsciousness will follow. In the jungle, so to speak, it is certainly not survival. If we examine the attachments of the temporalis muscles, we see that they are attached in such a way that they overlap these sutures by a wide margin so that contraction of these muscles will form a locking device for these non interlocked sutural mechanisms. This, then establishes a certain structural integrity to the skull from the outside.

The contraction of the masseter muscles initiates the contraction of the pterygoid muscles, both medial and lateral. The contraction of the medial pterygoid muscles tend to hold the jaw [mandible] in place along with the masseter muscles, establishing a certain degree of structural stability from the inside of the jaw, in the case of the pterygoid and the outside of the jaw, in the case of the masseter. The contraction of the lateral pterygoid muscles do two very important things at the same time. Being attached to the greater wings of the sphenoid bone on one end and the jaw on the other end, the contraction of the lateral pterygoid muscles pulls on the greater wings thus restricting motion and also helps to stabilize the mandible. This action tends to lock the sphenoid in place. It, therefore, locks the skull from the inside to further protect its structural integrity in the case of a blow to the head. While exerting a downward pull on the greater wings of the sphenoid the

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external pterygoids tend to bend or flex this very thin bone downward. The bending or flexing of the bone which makes up the main section of the floor of the cranial vault causes a tightening of the dura. This increased dural tension causes the dura to act as a sort of trampoline to give a resilient wall for the brain to bounce against in the event of a blow to the head. This innate protective mechanism is vital to survival and protects the skull and brain from damage under normal circumstances. What about the rest of the central nervous system, the spinal cord, and its protector, the spine ?

When we look at the spine we find a unique combination of bones designed to do many things. It encases the spinal cord, supports the body, allows for all sorts of motion and body positions, allows for the passage of nerves from the cord to the body for communication of data both into and out of the central nervous system, is a shock absorber and a protector all at the same time. These spinal bones are highly mobile within a circumscribed range of motion. They are moving all the time either in respiratory or in body activity. The contraction of the intrinsic muscles of the spine and the other muscle groups move the spine in varied activities and tend to hold it together at the same time. The intrinsic and extrinsic spinal ligaments are responsible for the primary stability of this structure but it is still subject to injury and on occasion either luxation or subluxation.

Additional mechanisms are also necessary for survival. The fascia and skin are contracted over the entire body causing the hair to stand up to partly scare the enemy by enlarging its size and to act as a cushion to some degree. We see in a animal the greatest evidence of this contraction over the face, head and spine. We can sense this same contraction in ourselves when in danger, our hair stands on end and we get "goose pimples" along our

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spines. This contraction also helps to push the blood away from the surface to help prevent heavy bleeding from superficial wounds and again to hold the body and its parts together. These are, for the most part, observable and documented reactions to danger.

We also observe that the animal pulls his tail between his legs in time of danger. Why? To get the tail out of the way ? Maybe, but more importantly to increase the tension on the spinal dura to protect the cord and to pull the spinal bones together thereby increasing its strength and make it more resistant to luxation, by shortening its length. The human animal also has a tail, it is called the coccyx. It does the very same thing that the animal tail does for an animal. Let us look at this marvelous mechanism and how it works.

The dura is a continuous very strong membrane encasing the brain and spinal cord. It attaches in the skull as described above and then to the foramen magnum at the base of the skull, skips the atlas, is attached to the second and third cervical vertebrae and then to the posterior wall of the second sacral segment and by the filum terminale into the coccyx. The dura mater is composed of criss cross fibers which pull together or constrict in the case of a tube when a stretching tension is applied to it. This accomplishes a number of things in relation to defense and/or survival. The cord occupies a very small space within the neural canal in the first place. Approximately 1/5 the available space. This is reduced further when the dura reacts to tension an stress. The dura is firmly attached to the foramen magnum and then the 2nd and 3rd cervicals. Tension in this area reduces the dimensions of the cord which help protect it in sudden head movements, particularly blows to the head. The dural attachments allow the atlas to be the only

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freely movable vertebrae in the spine to act as a washer so the head can have full range of motion and yet be securely anchored to the body. The next area of constriction is at the area of the 7th dorsal vertebrae. This is the pivot area of the spine for motion and allows for more space between the cord and the bones of the spine. The next area of contraction is at the 5th lumbar, again for the same reason.

The length of the spine is shortened by the dural tension to bring the articular fascets closer together and slightly compress the discs to increase the tensile strength of the entire spine.

The contraction of the coccygeal and levator ani muscles are responsible for this entire procedure. These are two rather large muscles in relation to the area and in relation to the function attributed to them in the texts. The movement of, and position of, the coccyx has been a wonderment to many in the healing arts. Various techniques were established to attempt to make a change or correction in position. Little changes were made primarily because the technique attempted to stretch the muscle or change the tension in the ligaments. These muscles are directly reactive to the lateral pterygoids and are part of the defense or fight/flight innate reaction. The coccyx will only therapy localize in relation to the sphenoid. The patient touches the lateral masses of the sphenoid on both sides and then an anterior challenge will therapy localize. Correction is made after the Defensive Jaw Complex is completed by anterior stressing of the coccyx while the patient contacts the lateral masses of the sphenoid on two or three inspirations.

The Right T.M.J. unilateral therapy localization, utilizing the opposite gluteus medius muscle [only], is the indicator of the defensive jaw complex.

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This complex is corrected by first doing spindle cell activity to the masseter and temporalis on the right to reduce tension. Therapy localization will then indicate involvement of the left lateral pterygoid. Rub the left lateral pterygoid in the pterygoid fossa. A T.L. to the left T.M.J. using the opposite gluteus medius, will then indicate the involvement of the masseter and temporalis on the left. Spindle cell activity of the left masseter and temporalis, again to reduce tension is then instituted. A T.L. will then indicate a right lateral pterygoid involvement. Rubbing of the right lateral pterygoid in the pterygoid fossa will complete this correction. Turn the patient over and proceed with the coccygeal correction [as above]. On the average, the spine of each patient elongates approximately one to one and one half inches immediately, indicating a release of the dural tension.

Although this procedure can be done as a specific entity it is intended to be part of a complete neural organization protocol and is usually done as the finalization of the overall treatment protocol or after the switching and lateral occiput/anterior atlas corrections. The full lengthening of the spine will not take place until the complete neural organization procedures are completed however, indicating that all segments of treatment are necessary.

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THE CRANIAL INJURY COMPLEX

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ABSRTACT

The Cranial Injury Complex is the underlying cause of much of the post-traumatic symptomatology, particularly the head, neck, back, gait and the other, sometimes subtle, problems manifest after a cranial trauma. It has resisted detection with the usual methods of examination and therefore effective treatment has eluded the unfortunate patient. It can be caused by trauma to the head either great or small. It is a condition which results in the loss of the physiological centering of the skull and its interaction with the neck righting reflex. A reactive muscle system fault is established which will underlie many chronic physical problems because the real cause of these problems has not been corrected.

Neural Organization Technique, a specialty utilizing Applied Kinesiology methodology, has given very specific indicators for the existence of this condition and has provided a successful treatment protocol.

INTRODUCTION

The symptoms of cranial injury are frequently insidious and give no apparent specific outward manifestation of its actual presence. After the initial injury, which may have been severe, with blood, unconsciousness, concussion, etc., or relatively minor, with nothing more than a slight bruise, the patient seems to recover. The injury seems to heal, the pain goes away, and everyone forgets about it, but the patient is never "right" after the incident. He/she

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may have headaches, back problems, neck problems, or seem to injure himself more easily or frequently, often there are subtle changes in personality and behavior and mental function. Careful investigation does not reveal any specific symptoms that can be directly attributed to this injury. The doctor may find various cranial faults, if he is aware of cranial faults. There is always a tension at the back of the neck, the patient always has some sort of a gait problem, with one foot forward, turning in, turning out, etc.. There may be headaches, eye problems, ear and jaw problems, etc.. All are treated in various ways with some success but there is always some symptomatology present. Many times stress will bring the latent symptoms to the fore, yet nothing seems to indicate a head injury, it healed, didn't it? The cranial injury complex patient is an enigma.

THE CRANIAL INJURY COMPLEX

The Cranial Injury Complex is a disorganization of the reciprocal sutural motion of the skull and the righting reflex mechanism of the head and neck and its relation to the reactive muscle system of the body. Because the reciprocal tension membranes of the skull are anchored in the sutures of the skull and become part of the periosteum of the suture, the reciprocal motion of this support system of the brain is also at fault. This alone can create a myriad of problems. Because there is a continuum of fascia throughout the body, there can be many other direct implications to this problem. We can expect some disorientation of the normal brain activity, usually manifest in the motor functions, but can be in memory, circulation, balance, etc..

During the usual Neural Organization Technique testing procedures, one frequently found the double labyrinthine and/or ocular righting reflex fault pattern in the same eye option (eyes open or eyes closed) in the same phase of testing. Making the usual cloacal, labyrinthine, ocular

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righting reflex corrections the gait and the reactive muscle problems, related to gait, corrected at the time of treatment but the neck righting reflex fault was still present if tested and the neck flexor muscles would not strengthen with any technique. Gradually the cloacal, labyrinthine, and ocular righting reflex faults would return or different ones would occur without any apparent trauma. The case histories provided the first clue, these patients had all sustained head injuries. Some could not remember the incident, but upon questioning, it was found that they had had a head injury, in some cases, in their early childhood or even at birth.

Further analysis of the head posture and movement led to the conclusion that some fault was still present in the centering or balance mechanism of the head or skull. After clearing all cranial faults that could be found and some that were presumed to have a possible involvement, even when they did not therapy localize, the problem of head centering or balance, particularly with its relation to the neck righting reflex, which is responsible for balancing the head on the neck [or the neck under the head], still persisted. It was apparent that the skull had lost its physiological center and was trying to balance on the neck by recruitment. The neck muscles were always in some sort of stress, not necessarily major stress to restrict motion, but stress nevertheless, so that there is always hypertension in the posterior neck extensor muscles and therefore reactive hypotension in the flexor group. This reactivity then necessitates hypertonicity of the psoas muscles with the abdominal group being hypotonic in reactivity. The quadriceps muscles will then be hypertonic in reactivity to the abdominal hypotonicity and the hamstring muscles will therefore be hypotonic to the hypertonic quadriceps. The extensor muscles of the back will, of necessity be hypertonic. This follows the normal reactive muscle system of the body and the weight of the head in the erect position is sufficient to activate this reactive system. The extrapolation of this phenomenon should be obvious as a hypertonic muscle bundles, not going through the normal rest period, will quickly weaken on stress.

Closer inspection indicated that on respiration a problem in the reciprocal motion of the temporal, sphenoid and frontal bones existed. Because they do not therapy localize individually

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but only in relation to each other under these circumstances, it became apparent that the double labyrinthine and/or ocular righting reflex was the specific therapy localization indicator. This double therapy localization can occur either by themselves [you must therapy localize them one at a time, however], or in combination with the cloacal reflex, either anterior or posterior. This indicates the presence of a cranial injury complex but does not indicate which reflex combinations need correcting. Because the head is in need of centering or, more properly, righting, the righting reflex mechanisms of the head were the obvious place to start an investigation.

It should be noted here that before any corrections to the skull are attempted the so called universal cranial fault mechanism should be investigated. This can be found by a double hand therapy localization to the occiput using an indicator muscle or by tongue protrusion to both the right and then the left, using an indicator muscle, to determine the side of correction. If both sides therapy localize the indication is an anterior atlas subluxation. This is corrected either intra orally on the anterior tubercle of the atlas or bilateral medial thrust with the tips of the thumbs in the groove under the ear, anterior to the lateral masses of the atlas, with the chin protruded forward as far as possible. An anterior atlas will always indicate a cranial injury complex with the activating force of the injury in a downward motion. This would be also found in cranial injury resulting from a stressful birth situation where the baby was stuck in the birth canal for some time.

By therapy localization of the labyrinthine righting reflex with both ocular righting reflexes, one at a time, with the eyes open and then closed, the combination for correction is revealed. The correction is accomplished by adjusting the labyrinthine with the ocular reflex simultaneously. Because we are dealing with the tension membranes of the skull and the reciprocal motion of the cranial bones, the respiratory assist correction is best, although correction can also be accomplished with a heavy rubbing technique. The labyrinthine righting reflex is corrected by contacting the inferior part of the occipital side of the sutural groove

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between the mastoid portion of the temporal bone and the occiput and rotating the bone inferior and anterior on inhalation. This enhances the respiratory motion of the occiput and has a normalizing influence on the reflex mechanism. The ocular righting reflex is corrected by contacting the mitotic suture of the frontal bone with the heel of the hand, to anchor the movement, while the fingers, contacting the lateral aspect of the frontal bone, are lifting on inhalation [the frontal bone flexes on respiration like the wings of a gull, somewhat fixed in the center].

When all the combinations are corrected, the effects of the cranial injury on the reciprocal sutural motion of the skull, and the reciprocal tension membranes of the brain and skull are eliminated or neutralized in the static position, and the head is now returned to physiologic center.

Once the head centering/righting has been accomplished, the neck righting reflex must be adjusted to restore its function. This reflex mechanism is found deep in the fascia in the laminal groove and the posterior facettes of the upper three cervical vertebrae. Only a bilateral therapy localization with the eyes open and then closed will determine the fault pattern. A heavy rubbing with the fingertips in this groove, with the proper eye options, makes this correction.

It became apparent on further analysis that only the static positioning and balance was being addressed in this manner. Motion had to be considered. The vestibulo-ocular reflex which is responsible for equilibrium and/or righting in relation to motion was then considered. It therapy localizes with either head or eye motion and because of convenience, eye motion was chosen. The index finger is inserted into the ear canal [vestibular] while the fingers of the other hand contact the supra orbital notch [ocular]. This reflex only therapy localizes when the eyes are directed right, left, up and down or on diagonals. Correction is accomplished by pulling the ear lobe out and down toward the point of the shoulder on the side being corrected while the lateral edge of the frontal bone is lifted on inspiration. This then, restored the head righting and physiological center [equilibrium] in motion. The neck righting reflex is again therapy localized

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one at a time in relation to the vestibular reflex [Vestibular-Neck Righting Reflex, found by the author] to determine how the head reflex relates to the neck righting reflex in motion. This is done by inserting the index finger in the ear canal with one hand and therapy localizing the neck righting reflex [1st 3 cervical lamina] first on one side and then on the other side, with the other hand, while the patient looks right, left, up and down. Then the other vestibular reflex is tested in the same way. Correction is made by pulling the ear toward the point of the shoulder, with one hand, while applying a heavy rubbing motion in the laminal groove with the other while the patient looks in the directions of failure. Use a respiratory assist. The Neck Righting reflex is again therapy localized as above but with the Ocular-Righting Reflex [supra orbital notch], for the same reasons as above, while patient looks in directions R.L.U.D.. Correction can be made either with a heavy rubbing on the supra orbital notch while rubbing the N.R. reflex or with a respiratory assist to the frontal correction for this reflex while rubbing the neck righting reflex with the proper eye options. [Ocular-Neck Righting Reflex, discovered by the author]. This then stabilizes the head on the neck in motion.

It became apparent that the intrinsic motions of the skull must also be addressed. The respiratory motion of the spheno-basilar mechanism in relation to the N.R.R. [Spheno-Basilar Neck Righting Reflex, discovered by the author] must also be considered if full correction of this fault is to be accomplished. This proved to be a fault in the static position and therefore the eye options are open and closed not R,L,U,D. The Neck Righting Reflex is again therapy localized with the Spheno-Basilar mechanism. This is done by contacting the N.R.R. on one side then the other with the occiput and/or the N.R.R. with the lateral aspects of the sphenoid. Correction is made either with an assistant lifting the spheno-basilar mechanism [one hand under occiput, fingertips under the edge of the occiput while the fingertips of the other hand contact the supra orbital ridge and lifting or pulling gently both toward the top of the head] while the doctor applies heavy rubbing bilaterally to the N.R.R., or with one hand lifting the occiput headward while applying heavy rubbing to the N.R.R. one side then the other, eyes open then closed, and

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then lifting on the superior ridge of the orbits, while applying heavy rubbing to both N.R.R. one at a time eyes open and closed.

There is always lateral pterygoid involvement in the spheno-basilar motion both in the static position of the head and in motion of the head and these muscles are involved in the internal locking of the sutures in defence, they are therapy localized against the N.R.R. both with the eyes open and closed and with the eyes R,L,U,D. [Lateral Pterygoid-Neck Righting Reflex, discovered by the author]. Corrections are made by inserting the index finger in the pterygoid fossa applying a rubbing motion while rubbing the N.R.R. with all the above eye options.

The head can now center/right to itself, the neck can now center/right to the head, in both the static position and in motion, the spheno-basilar motion can now be integrated with these reflexes, the head and neck can now center to the body and in conjunction with the basic cloacal, labyrinthine/ocular centering/righting reflex system to stabilize the body position and the gait reflex system, an integration of structural centering/righting is accomplished.

The Cranial Injury Complex correction is essential for anyone who has had a cranial injury, at any time in their life. If it is not corrected, the neck extensor muscles are always defensive, literally trying to hold the head on the body and therefore hypertonic, trying to stabilize the head. By reactivity, the neck flexor muscles are always hypotonic and by reactivity the rest of the reactive system sequence described above. This reactive muscle sequence puts the body in a compromised condition. If we consider that a hypertonic muscle is more subject to fatigue than a normal muscle, we see where the psoas can fatigue and become weak easily. If we consider that the abdominal muscles, reacting to the hypertonic psoas are hypotonic, the low back is considerably at risk under these circumstances as the abdominal muscles are the anterior stabilizing muscles of the lower trunk. If the psoas fatigues and weakens there is no stability to the lower spine.

Injury to the skull at birth and injury in the first year of life can and does produce the cranial injury complex, and we see some very dramatic examples of that type of injury, but for

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the most part, the cranial injury complex is activated by injury after the cranial bones are more completely formed, that is, when the physiological cranial bone motion is accomplished in the sutures and not in membrane, as is found in very early age.

Because a cranial injury must be interpreted by the body as an attack on its survival, a very specific defense system is activated as a result. This defense system is described in the paper on the Dural Defense System [I.C.A.K. Winter'88]. This system is therapy localized from the Right T.M.J. in the clear utilizing specifically the left gluteus medius muscle as the indicator muscle. The Defensive T.M.J. Complex is thus revealed. The right masseter is first triggered in the belly and then the insertion of the muscle, the spindle cell activity is applied to both the right masseter and temporalis muscles to reduce tension, then the left external pterygoid, reactive to the right masseter/temporalis correction, is rubbed in the pterygoid fossa. Spindle cell activity is then applied to the left masseter/temporalis complex, reactive to the left pterygoid correction and then the right external pterygoid, reactive to that correction is then rubbed in the fossa. If there was a high level of pain associated with the injury then the Left T.M.J. pain control mechanism was activated. This is a mirror image of the Right T.M.J. complex described above and must be therapy localized utilizing the right gluteus medius muscle as the indicator. Correction is exactly the reverse of the right T.M.J. complex. The patient is then placed prone and the lateral masses of the sphenoid are therapy localized while the coccyx is stressed anterior for at least three deep respirations. This releases the dural tension which was activated to stabilize the skull and spine to help protect them from damage and to protect the brain and spinal cord housed within.

It should be obvious that in the event of a cranial injury many of the basic functions of the individual are compromised and should be addressed as part of a more complete treatment protocol. The cranial injury complex correction should be done, if found, as part of the basic Neural Organization Technique procedure to insure a more positive response to treatment with the least amount of residual deficits. If this procedure is not followed, so that the reflex

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indicators, bilateral labyrinthine or ocular as described above, will not be tested and found, the cranial injury complex can still be found, if suspected, by bilateral therapy localizing the neck righting reflex at the level of C 1,2,3, using any intact muscle as the indicator mechanism. Treatment as above will still be a great benefit to the patient, in any event. It is always advisable to have the patient do a cross gait movement while on the table, or take a short walk, and then retest the neck righting reflex to determine if all of the cranial injury complex has been corrected. We can understand from the reactive muscle response mentioned above how important this can be.

Because of the hypertonicity of the neck extensors; headache, eye strain, loss of the normal cervical curve, neck, shoulder and arm and low back pains may be expected as natural consequence of this condition. We can now understand that the cranial injury complex has been responsible for a multitude of problems, which up to now, the causes of which have resisted detection and therefore resisted correction.

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Dr. Carl A. Ferreri, 3850 Flatlands Ave., Brooklyn N.Y. 11234 [718]253 9702

A DOUBLE BLIND STUDY
OF
RAW VS. COOKED
FOODS
UTILIZING MUSCLE TESTING
AS THE STUDY PARAMETER

BY
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ABSTRACT: A double blind study was set up to ascertain if any differences might arise in manual muscle testing between raw and cooked foods. Although, the numbers were not exhaustive enough to make a definitive statement as to whether or not raw foods and cooked foods initiate changes in manual muscle tests, this pilot study did show little if any, significant results between the two groups. The author offers speculation regarding the outcome of the testing.

Upon listening to Dr. Goodheart's monthly tape on raw and cooked foods, I thought it a good idea to set up a double blind study and see if there would be any differences between muscle tests of raw foods and cooked foods. The test was set up to be as intellectually honest as possible with the consideration that I was the muscle tester. My wife, Kathleen, became the project coordinator and my C.A., Rebecca, the test subject. The foods were purchased from the farmers market in our town were possible so that as many of the foods as possible were uncontaminated with chemicals. The foods chosen for the tests for the raw were the same as those chosen for the cooked. In fact, the specimens for the raw and the cooked were taken from the same portion of the fruit or vegetable. The foods were steamed at 212° F until fork tender quality.

Only the project coordinator knew what was in the mouth of the subject. The subject may have been able to taste the foods but had no idea what the tests were being done for in any way. Myself, being the testor, did in fact know what the tests were being done for but had no knowledge of what was in the mouth of the subject. I was asked to stand outside of the testing room with the door shut and then asked in when the subject was prepared for the test. I used the subject's pectoralis sternal major and her gluteus medius for all of the tests. Some placebos were utilized by the project coordinator. In the event that a weakness was found, the tester was called in to test the subject to make sure that the subject had returned to strength before proceeding to the next test. The subject's

mouth was rinsed with deionized water after each test. The subject's mouth was closed as I entered the room so that I could not see the test specimen. The subject was asked to chew the specimen before the test. The following are the results of the testing:

Food Tested	Result	Food Tested	Result
Test #1		Test #3	
C apple	S	C carrot	Very W
R apple	S	R carrot	S
C carrot	S	C celery	S
R carrot	S	R celery	S
C cauliflower	S	C beet	very S
R cauliflower	S	R beet	S
C mushroom	S	C potatoe	S
R mushroom	S	R potatoe	S
C onion	S	C yellow squash	S
R onion	slightly W	R yellow squash	S
C potatoe	S	C parsely	very S
R potatoe	S	R parsely	very W
C ground beef	S	C radish	S
R ground beef	slightly W	R radish	very S
C pear	S	Nothing in mouth	S
R pear	S		
C peach	S		
R peach	W		
Nothing in mouth	S		
Test #2			
C cabbage	S		
R cabbage	S		
C carrot	S		
R carrot	S		
C broccoli	slightly W		
R broccoli	S		
C zucchini	S		
R zucchini	S		
Nothing in mouth	S		

The reader may concur that there is no apparent, marked differences between the test results of the cooked foods and the raw foods. Is that to say then that what Dr. Goodheart stated in his research tape was not correct? Is that to say that the Pottenger Cat Study was contrary to the results of this study? I think not. Cooked foods may not be actively harmful to a human being in that they contain little or no deleterious contents, however, they may be very harmful in a passive sort of way, in that they do not contain the necessary biochemical constituents that

enhance one's health. It is doubtful that the body is equipped to monitor the difference between the active and passive roles of foods in human nutrition. In conclusion then, I am saying that in my opinion, humans should certainly continue a high percentage of their diet in raw foods, however, this study does not show that cooked foods are actively harmful if ingested.

Christopher L. Harrison, D.C.

Paso Robles, California
October 1987

FISH FILLETTERS SYNDROME

By Hannes L. Hendrickson BChE, P.E., D.C.

ABSTRACT: This is a study of the results of arduous fish filleting. This work affects the humerus, proximal head of the radius, and the lunate and navicular bones of the wrist.

This paper is divided into three main categories. The first explains the steps in filleting. The second spells out the dysfunctions which result from filleting. And the third step shows the procedure for correcting these dysfunctions.

This is a case study of a young man, age 27, who has been filleting fish for at least 10 years. The fish can weigh in at 600 pounds. The first cut (picture 1) starts at the head where the knife is inserted and then run alongside the spine and ribs. The second cut starts at the tail of the fish where the knife is inserted on the other side of the spine and ribs and the cut is then made toward the head (picture 2). Other cuts are made while supinating and pronating the wrist (not pictured).

The first sign of the resulting dysfunctions would be a cry of pain--"My Right Arm Is Shot!". There would be subjective pain in the shoulder, elbow, and wrist.

An objective study will find that the head of the humerus has subluxated anterior & the head of the radius would have subluxated anterior. Also, the lunate and navicular bones in the wrist would have subluxated dorsally. Applying pressure with the fingers to these

(Continued on page 2)

(Fish Filleters Syndrome)

areas would be painful.

Special note: Pictures #3 and #4 show the medial twisting of the hand (towards the small finger) after an evening of fish filleting.

Muscle tests were performed on the right extremity with the following results. (Tests were as indicated in Dr. David S. Walther's book (ref.# 1): Right side only:

Latissimus dorsi-positive,
Deltoid-positive,
Supraspinatus-positive.

The subscapularis, brachioradialis, supinator, pronator teres, were normal including the musculature of the fingers.

Correction of these dysfunctions were made as follows:

Head of Humerus: (Picture #5) With the patient in a supine position (could be done with the patient standing also and grasping elbow from behind the patient's back) the doctor places a double hand contact over the right elbow and quickly drives the humerus head downwards.

Proximal head of the radius: (Picture 6) With the doctor and patient standing the doctor places a double thumb over the proximal head of the radius (the contact point is very painful). The doctor raises the elbow with the other fingers and then makes a rapid downward-whip-like movement-returning the proximal head of the radius into its normal position.

(Continued on page 3)

(Fish Filleters Syndrome)

Correction of lunate and navicular bones in right wrist:

(picture 7): Doctor and patient standing, a double thumb contact is made over the lunate and navicular bones on the dorsal side of the wrist. Again, the hand is raised and rapid -whip-like downward motion is made driving the two bones into their places. This area of the lunate and navicular bones is very painful. Take the contact at the elbow and the wrist at the most painful areas.

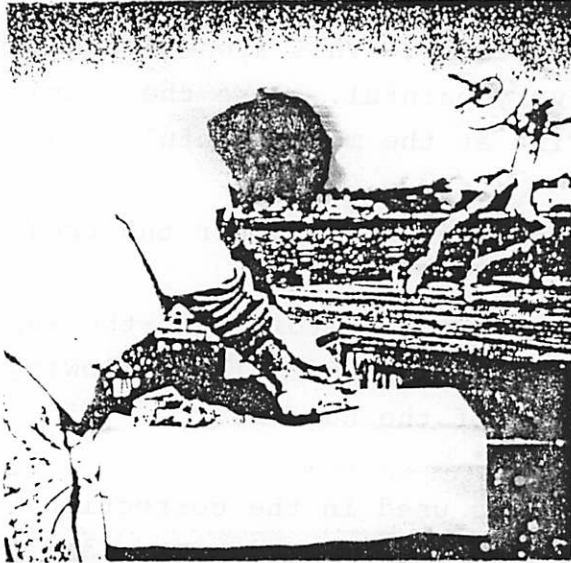
Picture 8 shows the corrected hand after the treatments.
(See page 5)

COMMENTS: The latissimus dorsi, deltoid, and the supraspinatus muscles returned to their normalcy following the correction of the head of the humerus.

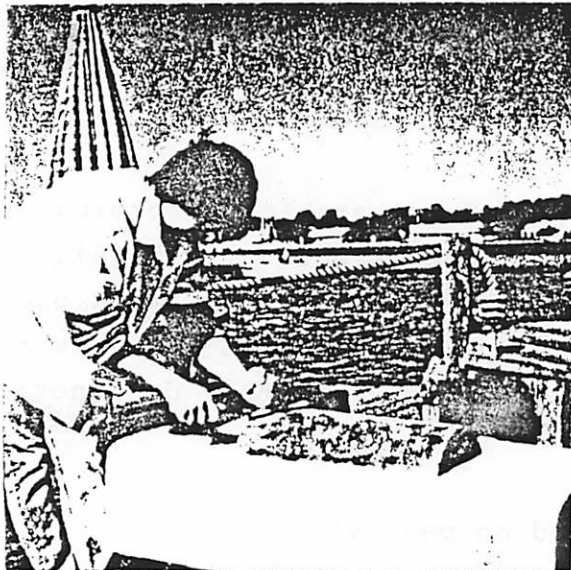
CONCLUSIONS: The procedures used in the correction of the dysfunctions were very rapid. At first Dr. Lawrence H. Jones's "Strain and Counterstrain" (ref #2) procedures were used in the correction of the anterior head of the radius (ref #3) as well as the correction of the lunate and navicular bones (ref #4). Because these methods were too tedious, the more rapid whip-like steps were used as described in this paper.

I wish to thank Dr. George Goodheart for informing the membership of ICAK of Dr. Jones's work (ref 5 & 6). Although Dr. Jones's was replaced with the steps used in the correction of the dysfunction, his work nevertheless was used on the patient-for other dysfunctions.

(Fish Filleters Syndrome)

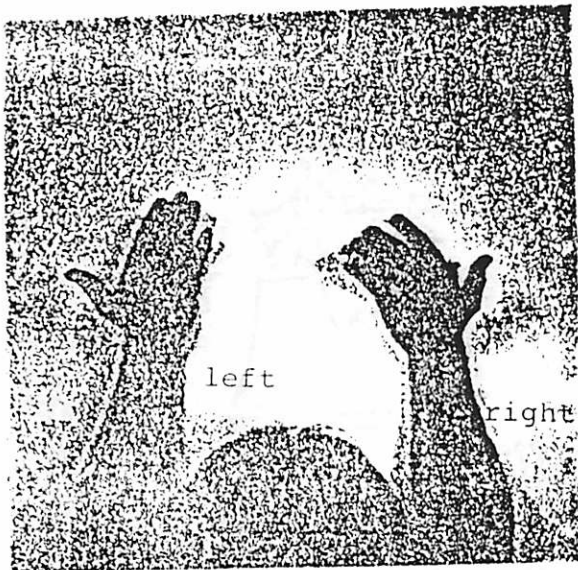


Picture 1
Start of first
fillet cut at head



Picture 2
Start of 2nd cut
from tail and up to
head

(Fish Filleters Syndrome)

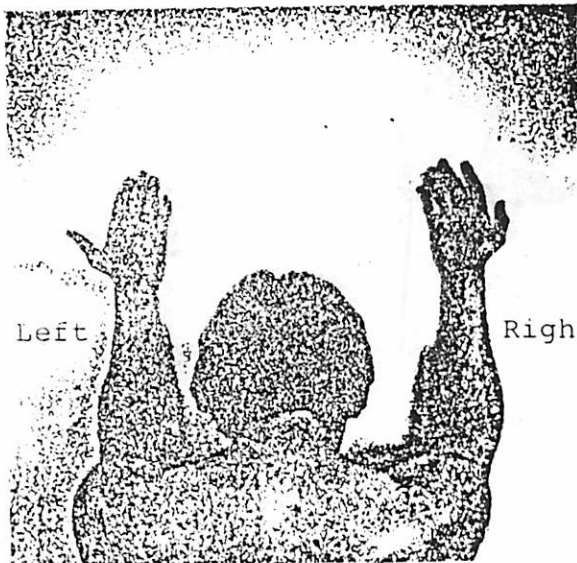


Picture #3



Picture S4

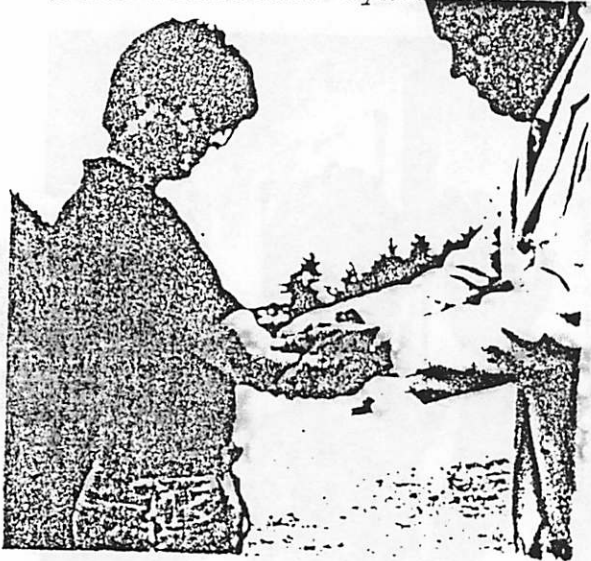
DYSFUNCTION OF RIGHT WRIST
(Following arduous fish filleting)



Picture #8

Correction of dysfunction
of right wrist

(Fish Filleters Syndrome)



Picture 6-Correcting anterior proximal head of radius



Picture 5-Correcting anterior head of humerus



Picture 7-Correcting lunate & navicular bones in wrist

(Fish Filleters Syndrome)

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THE RESTORATION OF LIFE

"KUATSU" (1)

HANNES L. HENDRICKSON, D.C., P.E., B.Ch.E.

ABSTRACT: KUATSU is a separate branch of Kano Jiu-Jitsu, which is the official Jiu-Jitsu of Japan. KUATSU "deals with the restoration of a contestant who has been rendered unconscious or apparently killed". (1).

Why this subject is of interest to the chiropractor is because many of the methods-or "TRICKS"- involve the use of heavy blows to the spine, or there may be a heavy "digging in the finger-tips vigorously into the collar-bone"(1), or "strike hard against the inner edge of the patient's instep" (1)-which is the area of the navicular and the first cuneiform bone of the foot.

The methods, or "TRICKS", were developed over thousands of years. Only a few of these "TRICKS" will be explained in this paper.

1. Case of extremely serious injury such as kicked in the stomach or side, or when the patient has been severely strangled, as with a rope, or sunstroke:

a. Patient is placed in a prone position, with the arms extended to the side and the heel of the hand is used to give a quick inferior to superior blow to the 7th cervical vertebra. The arm is kept close to the body when striking the vertebra. These blows are kept with a regularity. When the patient recovers he is brought to a sitting position and the arms are rotated first forward and then backward. This rotation of the arms -when brought forward-and then over the head is similar to the pectoralis stretch (2). And finally, the patient is aided in walking about.

(Continued on Page 2)

(Page 1-Kuatsu-Hendrickson)

(Page 2-KUATSU-HENDRICKSON)

Continued from page 1: In the case where the patient has not been revived by the preceding steps, the patient is placed in a seated position, with the head hanging forward, and supporting the patient with your left hand--this time strike hard again with the heel of the hand on the 7th cervical vertebra--do this "striking rhythmically and severely". Again, with the return of consciousness, the arms must be rotated as described and the patient must be walked by the kuatsu expert.. If this 2nd step, with the patient seated, still has not awakened the patient, the kuatsu expert then strikes the 7th cervical vertebra with the knee of his leg--"repeating this as long as is necessary"--again the arms are rotated and the patient is walked about. The rotation of the arms and the walking are a must in all cases. (This knee phase is done with the patient seated as in the previous procedure.)

2. The most important maneuver (out of 7 forms of Kuatsu) is used for "treatment of any kind of injury that causes unconsciousness or apparent death--also especially valuable in cases of seeming death by drowning":

a. With the patient in a prone position, the heel of the hand is used to strike one or two sharp blows on the 1st lumbar vertebra. The 2nd knuckle of the 2nd finger is also used. With the patient in a seated position the arms are again rotated. Finally, the patient is raised to his feet and assisted in walking.

CONCLUSIONS: Many of these "TRICKS" emphasize the importance of spinal treatments--and very severe at that. Again, the authors stress that many of these procedures should not be attempted on patient's who are conscious or "suffering merely from brain-fag".

(Page 2 -Kuatsu-Hendrickson (Continued on Page 3)

(Page 3-KUATSU-HENDRICKSON)

Conclusions-Continued: One "TRICK", which was mentioned in the "ABSTRACT" was the striking of the navicular and first cuneiform bone of the foot--this was one of the steps in aiding one who had been injured in the testicles (TRICK 6). A second phase of this treatment was "to give one hard knock at the back of the upper portion of the hip-bone." (some of the points are illustrated on 4 anatomy charts--these points are at times difficult to ascertain because of muscle, skin groupings above the points.)

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Another Diagnostic Approach to the Cruciate Suture Fault: Applications
for Spinal Centering

James D.W. Hogg, D.C.

Abstract: This paper is an extension of the paper on cranial fault frequency contained elsewhere in these Collected Papers. A method is presented for finding hidden cruciate suture faults that might be missed otherwise. In addition, a possible correlation between the cruciate suture and symphysis menti faults is investigated. Applications toward spinal centering torque procedures are also discussed.

Last November I had the opportunity to take the excellent cranial/TMJ class offered by Drs Goodheart and Leaf. Along with getting a good review of the material and updating my knowledge with the latest advances in these areas, I was introduced to a new significance to the cruciate¹ and saggital² suture faults. These faults were presented as being pivotal faults that can lock or unlock the cranium in the mid-saggital plane and essential not only to proper cranial motion but also in effecting a lasting adjustment to other cranials such as sphenobasilar faults. With this in mind, I made a practice of checking for and correcting the cruciate and saggital suture faults before doing any other cranial work.

The primary screening technique for the cruciate suture has been with a therapy localization to the suture (The cruciate suture is formed by the junction of the maxillary and palatine sutures which form a cross near the back of the hard palate, thus the term "cruciate".) with both thumbs near the back of the hard palate. A positive TL is then

(Another Diagnostic approach....Hogg.....page 1)

confirmed with a challenge by spreading the upper dental arch, pressure directed laterally in the area of the second molar. If this challenge causes inhibition of a previously strong muscle as exhibited by manual muscle testing, correction is then made by phasing the positive challenge to respiration and correcting over three or four respirations, pressing in the direction of positive challenge.

By giving the cruciate and saggital sutures primary consideration I was able to improve my results but was more than a little surprised that I was finding the cruciate suture fault fairly infrequently even in new patients. I then started checking my patients with both TL and challenge to the cruciate suture before concluding that a cruciate suture fault was not present. I began finding many instances in which a TL to the cruciate suture (I usually had the patient TL in the area of the anterior inter-maxillary suture in addition to the TL at the cruciate suture mentioned above.) was negative but in which a challenge to the cruciate suture was positive.

It was becoming apparent that the challenge was a more reliable criterion for the presence of a cruciate suture fault than the TL. Using the standard challenge involved either putting on two finger cots (I've been trying to keep my overhead down and those finger cots add up!) or instructing the patient so that they could perform the challenge. Both approaches were somewhat cumbersome and unsatisfying as a screening procedure for the cruciate suture fault.

After some experimentation, I found that the cruciate suture fault could be challenged from the exterior using a direct challenge. The procedure is as follows: Find a strong indicator muscle. Challenge the

(Another Diagnostic approach....Hogg.....page 2)

cruciate suture by pushing medial bilaterally in the area of the second molar and just superior to the gingiva. In other words, you are pressing on the outside of the mouth, through the cheeks in a direction to compress the cruciate suture. While holding this compression, test the previously strong indicator muscle. If the cruciate suture is jammed, this direct challenge will accentuate the fault and cause a systemic inhibition.

I have found this direct challenge to be more convenient and quick to use than either the traditional rebound challenge or the therapy localization. I have also found it to be a much more accurate indicator for the cruciate suture fault than the TL (See my paper on cranial statistics for information on how much more accurate I found it). One disadvantage of this direct challenge is that it can cause pain to the buccal mucosa if too much pressure is used. This is especially true if the patient is wearing dental braces! While I have not found this to cause false positives it seems that this might be a problem if very heavy pressure were used in the challenge. Of course avoiding unnecessary patient pain is also important. To reduce these problems it is important to make sure that you are pressing the cheek against the gingiva rather than the teeth and to use only about 2-3 pounds of pressure.

In discussions with my friend Tom Howard, D.D.S., a dental orthopedist. I was impressed with the importance of the meshing of the cusps of the upper and lower molars. Dr. Howard uses certain orthopedic devices to increase the width of the upper dental arch which has the reciprocal effect of widening the lower dental arch via this cusp

(Another Diagnostic approach....Hogg.....page 3)

mechanism. It thus occurred to me that if there was compression in the upper dental arch, it might result in compression in the lower dental arch and that if the lower arch were not corrected it may result in recurrence of the cruciate suture fault. The area that would be most affected by a compression of the lower dental arch is the symphysis menti. For the last month I have been checking for a symphysis menti fault whenever I have found a cruciate suture fault and vice-versa. I have found a fairly high degree of correlation but have not been gathering statistics long enough to give a meaningful rate of occurrence.

The symphysis menti (also known as the mandibular spread) fault may be therapy localized with a two fingered TL across the symphysis menti itself. It may be challenged by inserting the index fingers into the mouth on the mesial aspect of the lower dental arch in the area of the first molar. A rebound type challenge is directed laterally on both sides of the arch in a direction which will spread the arch. After pressure is released, test a previously strong indicator muscle for weakening as a result of the challenge. Correction may be made by either phasing the positive challenge to respiration and adjusting in the direction that produced weakness (spreading) on the phase of respiration that negated the challenge or by continuous pressure for about 30-40 seconds in the direction of positive challenge.

In discussing spinal centering, Schmitt³ mentions the use of a mandibular spread technique to effect correction of pineal imbalances as well as for correction of a counter-clockwise torque of the spine. This also relates to a situation in which a patient becomes stressed in the

(Another Diagnostic approach....Hogg.....page 4)

dark with difficulty getting proper rest during night-time sleeping. As you may recognize, this pattern corresponds with (and, indeed, is identical to) the sphenoid compression cranial fault first described by Goodheart⁴. In cases where mandibular spread is indicated for spinal balancing, I have been checking for, finding and correcting cruciate suture faults along with the symphysis menti/mandibular spread/sphenoid compression fault. While the cruciate suture fault has not appeared in 100% of the cases observed so far, there appears to be a 70-90% correlation.

In summary, direct challenge of the cruciate suture has been found to be much more accurate than therapy localization to the suture and more convenient than either the TL or a rebound challenge. It seems likely that the cruciate suture and symphysis menti faults go hand-in-glove (or cusp-in-cusp) much of the time and that both may have a bearing on pineal function, spinal centering and dural torque. Certainly it will be worth our while to check for both when either fault is found. Direct challenge of the cruciate suture should make this testing both quicker and more convenient!

(Another Diagnostic approach....Hogg.....page 5)

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3. "Centering the Spine; Functional Neurological and Biochemical Considerations" by Walter Schmitt, D.C., Collected Papers of the Members of the International College Of Applied Kinesiology Summer 1987 published by I.C.A.K. Shawnee Mission, KS.
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The Frequency of Three Common Cranial Faults

James D. W. Hogg, D.C.

Abstract: The frequency of occurrence of inspiratory assist, cruciate suture, and saggital suture cranial faults is reported for a sample of 265 patients. The frequency of effectiveness of different diagnostic methods is compared for the cruciate suture fault as well as the odds that a saggital suture fault may be hidden by a cruciate suture fault.

As noted in my companion paper¹ Drs Goodheart and Leaf re-kindled my interest in the cruciate suture fault at a cranial/TMJ seminar they presented in November of 1987. I was impressed with the role of both the cruciate suture and saggital suture faults in unlocking the cranium in the mid-saggital plane to allow more efficient correction of other faults such as the inspiratory assist fault. I started checking for these faults as a preliminary on all my cranial patients, but was surprised to find them much less frequently than I would have expected.

Further investigation prompted me to develop a method of direct challenge for the cruciate suture fault¹ that turned out to be more accurate than a simple T.L. and more convenient than the standard rebound challenge². I also noted that, in many cases, a negative T.L. or challenge for the saggital suture fault would turn positive after I had released a cruciate suture fault. It seemed to me that I had probably been missing these faults a good percentage of the time.

In similar situations when I have related my findings to people they often ask a question such as "How often do you find that to be the case?". Unfortunately, more often than not, my answer is something like

"Well I find it a lot" or "most of the time". Since terms like-"a lot" or "most" tend to be fairly subjective and prone to different interpretations by different people. I decided that this time I would do more than just count the number of times that I had noticed a particular finding. This time I kept comparative statistics.

The statistics listed below were taken from 265 patient trials. Included are patients who exhibited any or all of the inspiratory, cruciate or saggital suture faults. It does not include any patients who tested negative for all of these faults. Records kept included

1. Which of these faults were present simultaneously
2. When the cruciate suture fault showed, how often it showed with a T.L. as opposed to a direct challenge.
3. When a saggital suture fault showed, whether it was apparently "hidden" by a cruciate suture fault.

The inspiratory assist fault was tested using respiratory challenge (weak muscle goes strong on held inspiration), T.L. to the mastoid and with various vectors of P>A challenge at the mastoid process.

The cruciate suture was therapy localized on the mid-saggital line at the point where the maxillary and palatine sutures meet and also along the anterior 1/3 of the inter-maxillary suture. Positive response to the direct challenge was verified using the standard rebound challenge².

The saggital suture was tested with challenge and T.L. at three locations along the posterior, middle and anterior of the saggital suture³.

Results of these tests are listed below:

	Totals	% / 265 trials
Inspiratory assist fault	262	99%
Cruciate suture T.L.	17	6%
Cruciate suture challenge	128	48%
Saggital suture shows before cruciate correction	24	24%
Saggital suture shows only after cruciate correction	46	46%

Percentage of time cruciate suture fault shows when inspiratory assist is present = 49%

Percentage of time saggital suture fault showed when inspiratory fault was present = 18%

Percentage of time saggital suture fault showed when cruciate suture fault was present = 55%

Percentage of time saggital suture fault showed only after cruciate suture fault was released = 66%

Percentage of time saggital suture showed before cruciate suture fault was released = 34%

Percentage of time cruciate suture T.L. was positive when cruciate suture fault was noted using any of above analysis techniques = 13%

Percentage of time cruciate suture rebound challenge was positive when tested after positive direct challenge = 100%

Conciusion

About half the time that an inspiratory assist fault was found, there was a cruciate suture fault also involved. Saggital suture fault involvement was about half as frequent. In the presence of a cruciate suture fault, saggital suture faults were hidden over half the time. Well over three quarters of cruciate suture faults would have been missed if therapy localization had been the only screening procedure used. The direct challenge turned out to be a very effective method of screening for a cruciate suture fault having a 1:1 correiation with the less convenient rebound challenge. Since the saggital suture fault was so often hidden by a cruciate suture fault, I feel that the saggital suture fault should always be checked for after cruciate suture correction.

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2. 1980 Workshop Procedure Manual by George Goodheart, D.C. privately published.
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A COMPARISON BETWEEN THE ZINC TALLY TEST, GAMMA-2 MUSCLE TESTING, KININ
MEDIATED ALLERGIES, AND PRE-TEST IMAGING

BY MICHAEL LEBOWITZ D.C.

ABSTRACT: One hundred patients were examined to determine if there was a correlation between the zinc tally test and gamma-2 muscle testing for zinc levels. The relationship between pre-test imaging, kinin mediated allergies, and zinc levels was also studied.

The Zinc Tally by Metagenics Incorporated¹ is a zinc sulfate-hydrated solution in a base of distilled water. It is used in many applied kinesiologists (and other physicians) offices to measure patients zinc levels. Results are gauged on a scale of 1-4, scored as a result of the patients' response to the taste of the solution. It is taken in the quantity of 10 ml. and held in the mouth for ten seconds.

A score of "1" is when no specific taste is noted during the time period. This is indicative of a zinc deficiency. A score of "2" is given when no immediate taste is noted, but after a few seconds a slight taste develops. According to data on the label, they recommend supplementing these patients with zinc. Dr. Goodheart suggests that these patients probably need zinc². This author suggests that these patients are either slightly deficient or adequate (though barely so) in zinc levels.

A score of "3" is given when a slight taste is noticed almost immediately and it intensifies with time. These patients have adequate zinc levels. A score of "4" is given when the solution has a strong unpleasant taste the whole time. These patients also have adequate levels (according to label data).

With so many uninformed chiropractors and other health professionals claiming that A.K. is "not scientific", the author decided to devise an objective study to see how this particular test compared to gamma-2 muscle testing.³ Patients responses to CCK⁴, and Pre-Test Imaging⁵ were also measured due to their tie in to zinc levels (see their respective sections for more details).

The procedure was as follows. One hundred patients were taken over a period of 2½ months that exhibited a weak gamma-2 muscle. These patients were tested with pre-test imaging to see if it would strengthen the weak gamma-2 muscle. CCK was then orally insalivated and tested to see if it caused universal muscle weakness. Then a mixture of Zincomin and Zinc Picolinate (both by Nutri-Dyn) was placed on the patients' tongue and the weak gamma-2 muscle was retested. Results were noted in all of these three tests.

The patient was not informed on what was being tested or on the results. The doctors' normal exam was then performed. Before treatment was initiated, the zinc tally test was given. The grades were read from the Metagenics label and the patient responded. In this way, the score on the zinc tally test could not influence the muscle testing response. We feel the results were very objective.

Zinc Tally & Gamma-2 Testing

Gamma-2 muscle testing is a wonderful tool for determining systemic nutritional deficiencies. For this reason it was used in this study instead of just a normal gamma-1 muscle.

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Results were as follows:

Zinc Tally Grade	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Number of Patients per grade	16	63	17	4
# patients strengthening on zinc mixture	16	26	0	0
% of patients strengthening on zinc mixture	100%	41%	0%	0%

It is interesting to compare these results to those of Zatkin⁶ and his practice in Michigan. In his study, 16% scored "1" on the zinc tally (compared to 16% in ours), 31% a grade of "2" (63% in ours), 30% a grade of "3" (17% in ours), 23% a grade of "4" (4% in ours). Soils in West Virginia are very zinc deficient and people are in general poor and rely heavily on home grown foods. Nutritional deficiencies are very common here.

In our study 42% of the patients tested zinc deficient via gamma-2 testing. All patients scoring "1" on the zinc tally strengthened on oral insalivation of zinc, while no patients scoring "3" or "4" strengthened. This is a 100% agreement between the two methods of testing and speaks for the accuracy of both these tests. Frankly I was both surprised and pleased by these results.

Of those scoring a "2", 41% strengthened on oral insalivation of zinc. We feel that a grade of "2" shows marginal zinc levels and that muscle testing on a gamma-2 level should be the determining factor in these cases as to whether zinc supplementation is necessary.

KININ MEDIATED ALLERGIES AND ZINC TALLY

Dr. Walter Schmitt developed a simple accurate screening tool to determine if kinin mediated allergies are present⁴. This condition can make your quality of life very poor (I can attest to this from first hand experience), and correcting it is often quite simple. I urge you all to screen for it routinely.

The most common cause of kinin mediated allergies is a zinc deficiency. For this reason, we tested for the presence of kinin mediated allergies in this study (to see if systemic zinc levels correlated to prevalence of kinin mediated allergies). We had each of the 100 patients orally insalivate some cholecystokinin (CCK) and tested to see if it caused universal muscle weakness. Results are as follows:

Zinc Tally Grade	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Number of Patients per grade	16	63	17	4
# patients weakening on CCK	6	12	0	0
% of patients weakening on CCK	37.5%	19%	0%	0%

Out of 100 patients, 18 screened positive for kinin mediated allergies. And as you can see, 37.5% of those scoring grade "1" tested positive, 19% of those scoring grade "2", while no patients scoring grades "3" or "4" tested positive.

It thus appears that if zinc levels are adequate (grades "3" or "4"), a kinin mediated allergy will not develop. It also appears that the lower the level of zinc in the system, the greater the probability of kinin mediated allergies being present.

PRE-TEST IMAGING & ZINC TALLY

Dr. Walter Schmitt developed a screening tool called Pre-Test Imaging⁵. He found that if a weak muscle became strong after the patient imagined performing the test, this indicated the patient had one or more cranial faults present. I have been using this technique since April 1987 and have found it to be accurate and valuable.

Allan Zarkin⁶ in a very interesting paper in 1986 showed a correlation between cranial faults and the need for zinc. For this reason, this variable was included in our study. Procedure was to see if a weak gamma-2 muscle strengthened on Pre-Test Imaging (In all cases that this was observed, a cranial fault was later found and corrected, thus strengthening the gamma-2 muscle. This was done after the zinc tally was performed).

Results were as follows:

Zinc Tally Grade	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Number of patients per grade	16	63	17	4
# patients strengthening on Pre-Test Imaging	10	28	4	1
% of patients strengthening on Pre-Test Imaging	62.5%	44%	23.5%	25%

Out of 100 patients screened, 43% showed positive Pre-Test Imaging. As you can see, 62.5% of those scoring grade "1", 44% of grade "2", 23.5% of grade "3", and 25% of grade "4".

It can be seen that as zinc levels rise, the probability of cranial faults decreases. It is still possible though to exhibit cranial faults,

even if zinc levels are adequate. The per centage in grade "4" is somewhat deceiving due to the small number of people in this study exhibiting grade "4". Only one patient at grade "4" showed positive on Pre-Test Imaging. We feel that if more grade "4"'s were found, the per centage would drop to below that of grade "3".

CONCLUSION

To conclude, I feel that the results of this paper along with my paper "A Comparison Between Koenigburg's Test for Urinary Chlorides, Sulkowitch Test for Urinary Calcium, and Gamma-2 Muscle Testing"⁷ show the extreme accuracy of gamma-2 muscle testing. Applied Kinesiology is an objective and accurate science if performed properly by well trained individuals and this can and will be proven again and again.

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ESSENTIAL FATTY ACID/PROSTAGLANDIN IMBALANCES: A FURTHER CLINICAL UPDATE
PLUS A FEW FURTHER WORDS ON COPPER MICHAEL LEBOWITZ D.C.

ABSTRACT: A quick fairly all encompassing screening test is discussed as well as the role of a single supplement for correction of essential fatty acid/prostaglandin imbalances. Copper in the all strong patient is discussed.

In the last set of Collected Papers, I reported how besides aspirin, we sometimes need to test ibuprofen to screen for essential fatty acid/prostaglandin imbalances in the patient¹ or else we might have a false negative result. Expanding on this has evolved into a simple screening test. We keep a powdered mixture of aspirin, ibuprofen and acetaminophen in our office. I routinely test this mixture on each patient to see if it will strengthen a weak gamma-2 muscle². If it strengthens, I proceed to test all nutritional factors possibly involved: linseed oil, olive oil, vitamin E (low dose), vitamin C, B₆, niacin, magnesium, zinc³. I then supplement with any of these that strengthens the weak gamma-2 muscle.

I found that approximately 3% of my patients had this imbalance recur frequently, while a few other patients would need as many as 3-4 of the above stated nutrients. I started to explore the possibility of finding one single supplement to correct this imbalance.

I began to experiment with many different products- with no results. I then began to test spirulina.

Spirulina is a microalgae known for its high content of protein, vitamin A, B₁₂, chlorophyll. Further study showed that it also contains the following:

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pyridoxine 3mg/kg
tocopherol 180mg/kg
magnesium 1915mg/kg
zinc 39mg/kg
linoleic acid 13784mg/kg
gamma linolenic acid 11970mg/kg
alpha linolenic acid 427mg/kg

On the next 45 patients that tested positive for essential fatty acid/prostaglandin imbalances using the test described in this paper, I tested to see if spirulina would strengthen the weak gamma-2 muscle. It did in 44 of the patients. This product appears to replenish the body with the building blocks it needs to make anti-inflammatory prostaglandins. I still supplement with the individually needed nutrients and take the patient off all known hydrogenated fats and alcohol. If the imbalance does not leave, or recurs, or if the patient is on a very poor diet, I supplement with spirulina as a "background" nutrient. It is also interesting to note that of all my patients that were taking spirulina regularly before ever coming to see me, none tested to have essential fatty acid/prostaglandin imbalances.

Correcting these imbalances has been a very important tool in preventing recurring subluxations as well as alleviating joint pain, headaches, etc.

I also wanted to report further on my article on treating patients who have no weak muscles, and in addition, none of their muscles will weaken regardless of whatever sedation technique is used^{4,5}. We reported that copper supplementation (3mg/day) would allow their muscles to sedate using appropriate techniques. We also reported dramatic increases in ranges of motion,

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alleviate pain, etc. We only had three patients as of the initial report that fit the pattern.

As of this report it is still a rare condition but, we have found an additional three patients. Again all three exhibited the above mentioned pattern. All of the patients (including the initial three) became 100% symptom free (stiffness, pain, decreased range of motion) of very chronic problems that were partially or totally unresponsive to other therapies. Five of the six patients needed one or two followup visits. With the "all strong" pattern gone, the remaining weaknesses were easy to diagnose and correct. Two of the six patients have needed continued copper supplementation (3mg/day) for the past six months (when supplementation was withdrawn, symptoms returned quickly). With the other four patients, one month on copper brought long lasting results.

The results have been so dramatic in these cases that I urge you to try it on similar patients.

CONCLUSIONS

1. A mixture of aspirin, ibuprofen, and acetaminophen is an effective screening tool in testing for essential fatty acid/prostaglandin imbalances.
2. Spirulina should be considered as a possible supplement for chronic cases of this type.
3. Patients with all muscles strong and unresponsive to normal applied kinesiology sedation techniques can respond dramatically to copper supplementation.

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EMOTIONAL CIRCUIT BREAKERS: CLEARING OUT THE PHYSICAL EFFECTS OF MENTAL STRESS
SO THE BODY CAN HEAL ITSELF

MICHAEL LEBOWITZ D.C.

ABSTRACT: Too much mental stress can "blow out" organ systems and cause chronic and recurring problems. Detection and correction of imbalances due to mental/emotional stress are discussed.

We are all aware of the effects of mental/emotional stress on the body. Even though one side of our triad of health triangle is labelled mental, it is the most neglected third treatment wise in many of our practices.

Many of our patients are under either constant or intermittent high levels of mental/emotional stress and it is not uncommon to see a recurrence of either symptoms or findings due to this. We have all used the emotional neurovascular points with success at times, but I felt there must be more involved than just these points.

With the advent of gamma-2 muscle testing, tuning into supraspinal imbalances became much easier¹. In some of my more chronic cases, I had cleared out all the gamma-2 factors I could think of and yet still, a gamma-2 muscle weakness would be present with nothing left to fix it.

Since mental/emotional factors are supraspinal, I began to investigate this area. All these patients were stress prone and had very low stress tolerances, even after strengthening their endocrines, balancing them nutritionally, etc.

I remembered reading along time ago (though I can't recall the source) that LI-16 and GB-31 were somehow related to emotional imbalances. I began testing these points and found that they could strengthen weak gamma-2 muscles. They would also symptomatically bring a calmness and higher stress tolerance to the patient.

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These points didn't TL on all patients and I felt that maybe there were more.

I had recently been studying how hypothalamic set points could be changed by certain tapping procedures using acupuncture points that end on the head². I began to search all the meridians that end on the head for more "emotional circuit breakers". Along with GB-31 and LI-16 there are B-10, SI-11, TW-15, and St-30.

All patients that are under moderate to high levels of stress or that have had major emotional traumas are screened. Positive points will both TL in the clear and also strengthen a weak gamma-2 muscle. On many patients, as many as 8-12 of the 12 points will test positive on initial screening. Positive points are treated with hard sustained pressure for forty seconds.

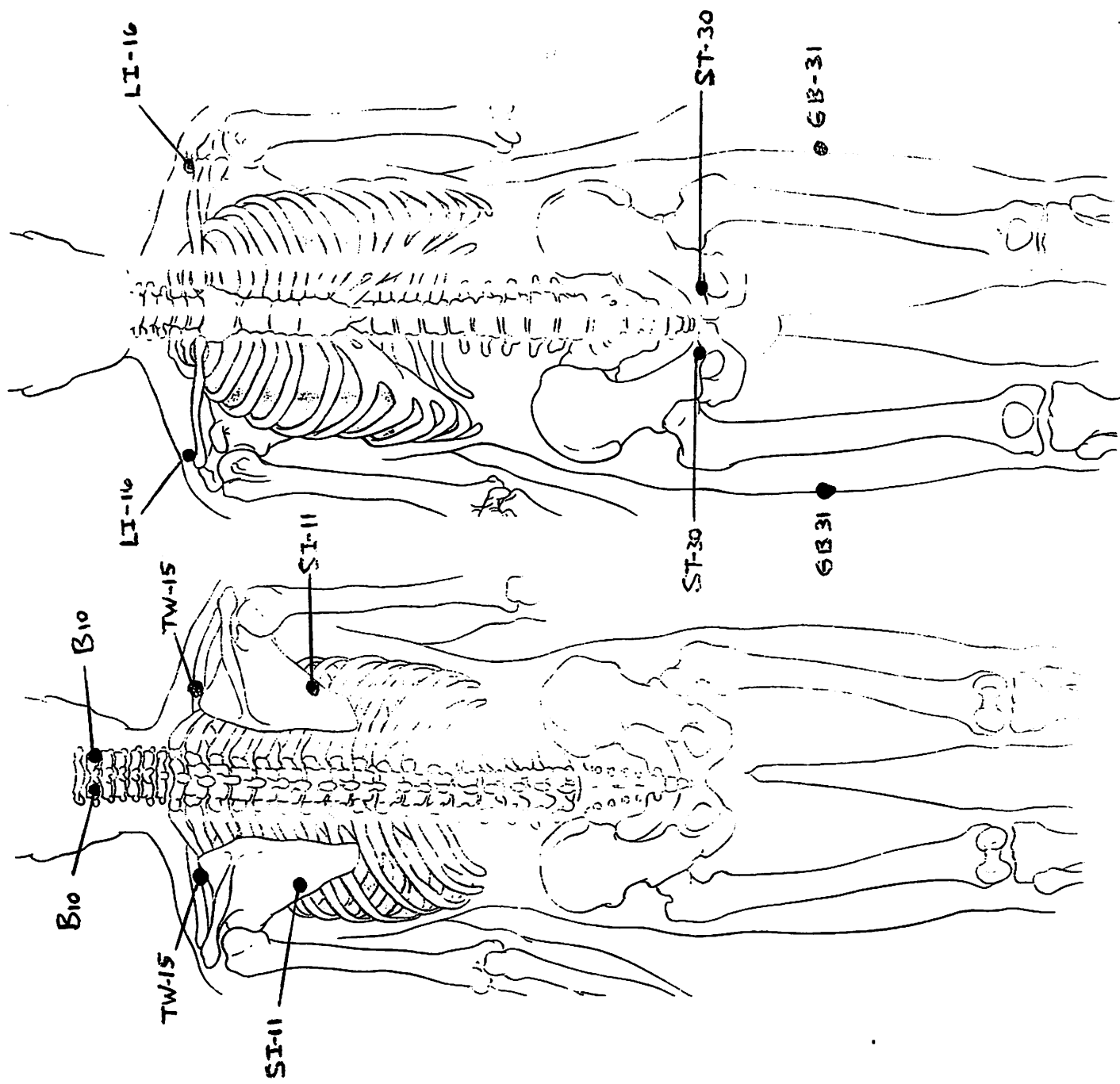
I started an investigation to see if there was any nutritional factors involved when "multiple circuit breakers" were blown. On all patients that had 4 or more points positive (about 100 patients to date), calcium would both negate the weakening of the indicator muscle while therapy, ^{localizing} the positive points, and strengthen a weak gamma-2 muscle. After calcium supplementation was implemented, all these points would test negative.

As indicated previously, patients undergoing this treatment would increase their stress tolerance levels, as well as exhibit calmer dispositions. I also found certain chronic visceral problems would no longer recur.

When multiple points show up, some will be extremely tender on treatment, while some will be fairly painless. If only one or two test positive they will usually be very tender.

Occasionally the points GB-31, TW-15, and SI-11 show up on patients more

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in the area of TW-15.5, SI-10.5, and GB-31.5. If the point you are pressing is not tender, you might want to move up or down the meridian a little bit.

One side note: On a small yet significant per cent of patients that show positive TL to either SI-11 or GB-31, there can be quite an emotional release accompanying treatment (usually crying).

A question of interest to me that yet remains unanswered is : Does a calcium deficiency lead to the emotional circuit breakers being positive, or does emotional overload lead to calcium deficiency? Your input is welcome.

Conclusion: In patients that have been under high degrees of stress- certain acupuncture points will TL. Treatment of these will strengthen weak gamma-2 muscles, increase stress handling tolerance, and prevent certain problems from recurring. Multiple points showing positive can be an indication of a need for calcium.

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SOME HELPFUL ADDITIONS TO GAMMA-2 MUSCLE TESTING

Michael Lebowitz D.C.

Abstract: Testing some gamma-2 factors with both eyes opened and eyes closed is necessary to find hidden weaknesses. Also discussed is a way to determine if nutritional supplementation is necessary.

Gamma-2 muscle testing¹ has helped me unravel some very difficult cases. In a few of our most chronic and severe patients, after fixing everything we could think of we would still have a weak gamma-2 muscle. At that time we took a seminar in Detroit in which Dr. Goodheart demonstrated the NEHT technique². Anxious to incorporate it into our gamma-2 regimen, we decided to start testing SI-19 with eyes opened and eyes closed to see if it would strengthen a weak gamma-2 muscle. We found that in many instances, SI-19 would only strengthen a weak gamma-2 muscle if the patients eyes were closed. We were previously missing many small intestine circuit imbalances we thought were negative. After doing this for a few weeks, a phone call with Dr. Walter Schmitt³ revealed that he too had found the same results at approximately the same time.

Logically I felt that if this was true for testing small intestine circuits, it would also probably hold for other gamma-2 testing. We began screening thymus NL, tonic labyrinthine reflexes, and endocrine NL with eyes opened and closed and found that many positive results were only revealed with the patients eyes closed.

We now routinely test SI-19, thymus NL, endocrine NL's, and tonic labyrinthine reflexes with both eyes opened and closed. We have also come to realize that any of the other acupuncture points that end on the head may strengthen gamma-2 weak muscles and indicate the need to work the NL reflexes of the corresponding organs (bladder, stomach, gall bladder, large intestine).

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These too need to be tested with both eyes opened and closed.

In the body chemistry section of gamma-2 testing, we routinely test such substances as CCK, aspirin, clorox, formaldehyde, acetone, etc.⁴ and record their effects on muscle strength. My most difficult case was testing negative on all these factors. She did though have a gamma-2 muscle weakness and all her symptoms made me suspect a kinin mediated allergy⁵. CCK (cholecystokinin) did not cause muscle weakness. We had her close her eyes and retested. The CCK then caused universal muscle weakness. The following week a patient weakened on formaldehyde only with her eyes closed (eyes closed in general did not cause muscle weakness in either of these patients). Weakening with eyes closed on biochemical screening is much less common than a NL reflex testing positive with eyes closed only. It is something though to be considered when you suspect a certain finding yet it tests positive with the patients eyes open.

Another problem we were faced with was when to use supplementation with positive gamma-2 findings and when to rely on structural work only (for example- if the adrenal NL were positive, should we work the reflex only, or also check for and give appropriate supplementation?).

After much experimentation we found that if temporal tapping brought back a gamma-2 muscle weakness, supplementation was necessary. We would proceed to supplement with whatever would negate the recurrence of the weak gamma-2 muscle when temporal tapping. If temporal tapping does not bring back the weakness, structural work is sufficient.

I am sure some of the above information could easily be adapted to gamma-1 testing also. We hope these small additions will prove helpful to you also.

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Conclusions

1. In gamma-2 muscle testing, SI-19, thymus NL, endocrine NL's, and tonic labyrinthine reflexes should be screened with both eyes opened and closed.
2. All meridians that have acupuncture points that end on the head should be screened on a gamma-2 level.
3. In difficult cases, biochemical screening should be done with both eyes opened and closed.
4. Temporal tapping will bring back a gamma-2 muscle weakness if nutritional supplementation is necessary.

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GV-21, THE HYPOTHALAMUS, AND SWITCHING

MICHAEL LEBOWITZ D.C.

Abstract: GV-21 is discussed in relation to the hypothalamus, and eyes open/eyes closed problems.

For a little over a year I have been studying about the role of the hypothalamus in chronic multiple endocrine and biochemical imbalances.

An acupuncture tapping technique¹, plus a technique demonstrated by Dr. Goodheart² have both proven very effective in changing hypothalamic set points.

I began screening some patients with Hypothalamus PMG, and Hypothalamex (both by Standard Process Labs) to see if they would strengthen weak gamma-2 muscles³. In many cases they did, and taking the supplements proved helpful. Upon further investigation, I found that all my patients that tested positive on hypothalamus tissue would also exhibit a positive therapy localization to GV-21. Further experimentation showed that rubbing GV-21 as if it were a neurolymphatic reflex would in most cases strengthen the weak gamma-2 muscle and abolish the need for hypothalamus tissue (using the temporal tapping technique described in my article "Some Helpful Additions to Gamma-2 Muscle Testing, also in this issue).

We have been using GV-21 as a hypothalamus reflex for four months now. The results have been gratifying.

I also discussed in "Some Helpful Additions to Gamma-2 Muscle Testing", the need to test endocrine neurolymphatics, as well as biochemical screening and most other factors with both eyes opened and closed in the problem patient. Many findings previously thought to be negative were actually found to be positive, and treatment led to relief of chronic symptoms. This finding has been extremely helpful, but it can get both tiresome and time consuming to

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test everything with both eyes opened and closed.

Further investigation has shown that if GV-21 strengthens a weak gamma-2 muscle, it should be treated at that point. After treatment of GV-21, all positive findings will be positive consistently with both eyes open and eyes closed thus eliminating the need of testing twice. Thus, GV-21 fixes some type of disorganization pattern that can give us false negative findings dependent on whether the eyes are opened or closed.

We propose that in gamma-2 testing, GV-21 should be tested and treated if necessary before testing other factors.

CONCLUSION: 1) GV-21 can be used both diagnostically and therapeutically for hypothalamic problems.

2) If GV-21 strengthens a weak gamma-2 muscle, the patient will usually have some findings that will only test positive with the eyes closed. Rubbing GV-21 as if it were a NL reflex will negate this pattern so that it does not matter whether the patients eyes are opened or closed.

I would like to thank Walter Schmitt D.C. and William Sisson D.C for their clinical trials and help in confirming the above research.

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A COMPARISON BETWEEN KOENIGSBURG'S TEST FOR URINARY CHLORIDES, SULKOWITZ TEST
FOR URINARY CALCIUM EXCRETION, AND GAMMA-2 MUSCLE TESTING

MICHAEL LEBOWITZ D.C.

ABSTRACT: Koenigburg's and Sulkowitch tests were performed on fifty patients. Each of these patients was also checked to see if a weak gamma-2 muscle would be strengthened by either calcium supplementation or therapy localization to the adrenal neurolymphatic. Results are recorded and discussed.

I have always tended to rely very heavily on applied kinesiology for diagnostic information, with some laboratory backup as necessary. With the advent of gamma-2 muscle testing¹, I decided to compare the results of the two urine tests I routinely run on patients, with gamma-2 muscle testing.

SULKOWITZ TEST AND GAMMA-2 TESTING

Sulkowitch test for urinary calcium excretion is used in many applied kinesiology offices. To briefly explain it, for those unfamiliar with the test, I will quote Dr. Walter H. Schmitt Jr. "For this test, we utilize the Sulkowitch reagent which causes the calcium in a solution to precipitate. The procedure is simple.

"Mix equal parts of urine (first A.M. sample recommended) and Sulkowitch reagent in a test tube. Observe the amount of cloudiness of the solution, if any.

"We grade the level of urinary calcium on a level of one to four, recognizing that the level of calcium in the blood will be paralleled by the level of calcium in the urine. In other words, the higher the level of calcium in the blood, the higher the calcium in the urine.

"And since the threshold at which serum calcium spills into the urine is at

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about 9 mg./100 ml. and since the normal serum calcium is from 9mg./100 ml. to 11 mg./100 ml., no calcium in the urine indicates that the blood calcium level is also low, below 9 mg./100 ml.

"The grading of urine calcium is:

- "1" clear solution, no calcium in the urine
- "2" a light precipitate - easy to read print on other side of test tube
- NORMAL "3" a fine, white precipitate - translucent appearance, can see lettering or print on other side of test tube, but not clearly enough to read it. Serum calcium = 9-11 mg./100 ml.
- "4" a creamy or milky solution which is opaque. Serum calcium levels are above 11 mg./100 ml. " 2

We ran the Sulkowitch test on fifty patients. On all fifty patients, we also tested to see if a weak gamma-2 muscle would be strengthened by oral insalivation of calcium (both Standard Process calcium lactate and Nutri-Dyn Calcimin were used in no set pattern). We used a gamma-2 weak muscle as opposed to a gamma-1 weak muscle because the gamma-2 weakness would better indicate a systemic deficiency.

Results were as follows:

SULKOWITCH TEST

<u>GRADE 1</u>	<u>GRADE 2</u>	<u>GRADE 3</u>	<u>GRADE 4</u>
22	7	16	5

STRENGTHENING OF A WEAK GAMMA-2 MUSCLE BY ORAL INSALIVATION OF CALCIUM

22	7	1	0
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As you can see from the results above, we had an overall correlation rate of 98%. All 29 patients that tested low in urinary calcium (grades 1 & 2 com-

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bined) strengthened on oral insalivation of calcium. Of the sixteen that checked normal on urinary calcium, only in one case did calcium strengthen a weak gamma-2 muscle. Of the five patients that had high urinary calcium, none strengthened on calcium insalivation.

I feel this is an excellent response in showing the accuracy of gamma-2 testing in determining nutritional deficiencies. It is also interesting to note that of the fifty patients tested, 58% were deficient in calcium.

KOENIGSBURG TEST AND GAMMA-2 TESTING

Koenigsburg test for urinary chlorides excretion is also used in many applied kinesiology offices. Once again I will explain it by quoting Dr. Walter Schmitt:

"Koenigsburg's test is a simply-performed test which we do on the first morning urine specimen (before eating or drinking anything)...

"The test is a titration which requires the use of two reagents: 10% potassium chromate, and 0.74% silver nitrate. The procedure is as follows:

1. Place ten drops of urine in a test tube.
2. Add 1 drop of 10% potassium chromate solution. Mix. The solution has a yellowish color at this point.
3. Titrate drop by drop the 0.74% silver nitrate solution. Observe for a change of color of the solution. The color will become red-orange to brick red, not unlike tomato juice.

"Titrate drop by drop, mixing the solution periodically to ensure equal mixture. The end point of the test is when the entire solution turns to brick red (or red-orange) color after mixing.....

"This is a screening test for adrenal function to be correlated with other

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factors..... In general, the greater the level of adrenal activity, the lower the number of drops to reach the end point. The exception to this is the exhaustion stage of the general adaptation syndrome (see below).

<u>During periods of:</u>	<u>Urinary chlorides will be:</u>
Hyperadrenia	less than 17
Hypoadrenia	greater than 25
Exhaustion Stage of G.A.S.	greater than 50 or less than 17
Normal Adrenal Function	17-25 drops "3

We ran the Koenigsburg test on fifty patients. On all fifty we also tested to see if a weak gamma-2 muscle would be strengthened by therapy localization to the adrenal neurolymphatics. We know there are more applied kinesiology indicators than just these, but for simplicity, we used these exclusively.

Results were as follows:

KOENIGSBURG TEST

<u>17-25 drops</u>	<u>over 25 drops</u>	<u>less than 17 drops</u>
14	29	7
STRENGTHENING OF WEAK GAMMA-2 MUSCLE BY TL TO ADRENAL NL		
2	29	2

As you can see from the results above, of the 29 patients taking over 25 drops to reach the end point (indicating hypoadrenia), all 29 exhibited positive therapy localization to the adrenal neurolymphatics. Of the 14 that tested normal (17-25 drops), two showed positive. We feel that since Koenigsburg test is basically measuring aldosterone levels, perhaps, these two patients were low in either cortisol or androgenic hormones, not aldosterone. This would explain a negative Koenigsburg with a positive therapy localization to adrenal neuro-

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lymphatics. In these two categories combined, the two testing procedures agreed 95.3% of the time.

In the case of the patients needing less than 17 drops to reach the end point - this finding can be due to hyperadrenia, extreme hypoadrenia, magnesium deficiency⁴, or possibly other factors. Because of the various possibilities and the fact that a hyperfunctioning organ does not always show positive therapy localization to its neurolymphatics, it is hard to determine how to correlate this category. Two of these seven patients showed positive therapy localization to the adrenal neurolymphatics.

Both the above urine tests do have some small amount of subjectivity in grading procedures. We feel though that the results of this study strongly indicate the accuracy of gamma-2 muscle testing in being able to determine deficiency states and hypofunctioning of endocrine organs. We strongly recommend mastering the valuable technique of gamma-2 testing.

CONCLUSION: Overall agreement between gamma-2 muscle testing and Sulkowitch and Koenigsburg tests was 96.8%. We feel this is an excellent response and clinically demonstrates the accuracy of this technique.

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BIOTYPES and ESSENTIAL FATTY ACID REQUIREMENTS

Dr. Philip B. Maffetone

Abstract: The relationship between biotypes and essential fatty acid (EFA) need is discussed. It will be shown that the endomorphic body type, when showing a need for an essential fatty acid, will typically require an omega-3 nutrient, such as linseed or fish oil. The body type of the ectomorph, when requiring an essential fatty acid, will typically show the need for an omega-6 fatty acid such as black currant seed or primrose oil.

INTRODUCTION

In 1929, Burr and Burr (1) showed that fatty acids were essential for health rather than optional nutrients, as was previously believed. Since then, many texts (2-5) have discussed the biochemistry and physiology of essential fatty acids. Applying this information to the health and fitness of a patient has been well documented by the scientific community (6-7), including some of the members of the International College of Applied Kinesiology (8-12). Other factors seem to be associated with fats as well. These include climate and biotype.

CLIMATE FACTORS and BIOTYPES

It is well known that climate has a definite effect upon our bodies (13), including fats in the diet and the way in which the body uses fats. In general, we generate and conserve body heat with larger amounts of stored body fat and muscle, and we eliminate heat best through a larger body surface area and less stored body fat.

In various climates, body type differences serve different

purposes. For example, in the cooler northern climates, there are generally shorter individuals with a smaller body area and a higher percentage of body fat. This is important for heat production and conservation. In the warmer southern climates, there are taller individuals with longer arms and legs, a larger body surface area, and generally less body fat. This is important for the elimination of excess heat.

There are three basic body or bio types (13): the endomorph, the mesomorph, and the ectomorph. The northern type body physique, typical of the Eskimo, is the classic endomorph, whereas the southern tall and slender type body is the ectomorph. The mesomorph is the best of the other two, often seen as the classic "athletic" type. Each biotype possesses classic structural, chemical, and mental characteristics. It is not the purpose of this paper to discuss these characteristics, but rather to relate EFA needs to the specific biotypes. This paper will only consider the ectomorph and endomorph biotypes in relation to EFA requirements.

EFA NEEDS

In Applied Kinesiology (AK) it is often observed that patients may require a specific source of EFA. This need may be satisfied by supplementing the patient with the specific EFA required: either an omega-3 or omega-6 source. In this study, the source of omega-3 nutrients used was either from fish oil (EPA-DHA from Nutri-Dyn) or linseed oil (Linum B-6 from Standard Process Labs). The source of the omega-6 nutrients used was either primrose oil (Gamma-Lin from Da Vinci Labs) or, more commonly, currant seed oil (Black Currant Seed Oil Extract from Standard Process Labs). When a need was found, the

appropriate nutrient was given for a short period of time. The patient was also instructed as to the importance of including that type of fat in the daily diet.

The diagnostic tests used to determine EFA needs included one or more of the following:

1. Aerobic fault as discussed by Goodheart (8).
2. Standard AK procedures for nutritional need - a generalized strengthening of muscle weakness (14).
3. Yaw #1 pattern as discussed by Schmitt (9).

RESULTS

Results were obtained by searching 200 patient files which met the following criteria:

- 1) The patient was either a dominant ectomorph or a dominant endomorph, based on anatomical features.
- 2) The patient showed a need for EFA.

Patient files which were ruled out were: a. those whose need could be satisfied by either source of EFA, b. those who needed both sources of EFA, or c. those who changed requirements over a period of time. There were four of these files.

There were 41 files which met the two criteria. Of these, 19 were endomorphs and 22 were ectomorphs.

Of the 19 endomorphs (see Table 1), 17 required omega-3 EFA (fish or linseed oil), and 2 required omega-6 EFA (currant seed or primrose oil).

Of the 22 ectomorphs, 4 required omega-3 EFA, and 18 required omega-6 EFA.

TABLE 1

Biotype	Total # Pts.	omega-3 (fish or linseed)	omega-6 (currant seed)
Ectomorph	22	4 (18%)	18 (82%)
Endomorph	19	17 (89%)	2 (11%)

CONCLUSION

This paper demonstrates the relationship that exists between EFA need and biotypes, specifically the endomorph and ectomorph. It is not the purpose of this paper to suggest a formula method for diagnosing EFA needs. Before giving a patient any nutrient, standard AK methods, or other rational means of analysis, should be employed.

This paper shows that a significant correlation exists between the ectomorphic body type and, when it exists, the need for omega-6 fats. A very similar correlation also exists between the endomorph and the need, when it exists, for more omega-3 nutrients.

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THE WARM-UP and WARM-DOWN: BLOOD FLOW CHANGES and EXERCISE

Dr. Philip B. Maffetone

ABSTRACT: One of the more important aspects of building health through exercise is "warming-up," which is the body's circulatory response: the shunting of blood away from the organs and glands and into the working muscles at the onset of exercise. Warming up too rapidly can be detrimental to the organs and glands of the body, which are the source of the health benefits of exercise. Using a basic Applied Kinesiology approach, it can be shown that shunting blood too rapidly will inhibit associated muscle function. Therefore, specific guidelines are given with respect to "warm-up" as well as "warm-down" procedures. Definitions of health and fitness as well as the differentiation between them are also given.

INTRODUCTION

A common question asked of doctors by patients is, "Do we need to exercise to be healthy?" It is obvious that due to our genetic make-up, we are required to be "active" to be healthy. This activity may be in any form: from the construction worker who is active all day long to the executive who sits all day long but jogs an hour in the evening. It is merely semantic that the latter is called "exercise."

DIFFERENTIATING BETWEEN HEALTH AND FITNESS

Many people believe that exercise will promote a healthy state. However, this is not necessarily true, especially when one surveys a large group of exercising individuals. Many people embark upon an

an exercise program only to end it with injury, sickness, and in some cases, death. The reason for this is that these individuals are trying to be "fit" before they are "healthy."

Many people consider themselves healthy because they have no major symptoms. However, a true practitioner of Applied Kinesiology observes imbalances which are not necessarily related to a particular symptom but which are adversely affecting health. HEALTH CAN BE DEFINED AS A STATE WHERE ALL THE STRUCTURAL, CHEMICAL, AND MENTAL SYSTEMS OF THE BODY ARE WORKING AT AN OPTIMAL LEVEL.

While in relatively good health, however, an individual is not necessarily able to achieve the abilities of a competitive athlete. FITNESS CAN BE DEFINED AS THE ABILITY TO PERFORM ATHLETIC TYPE ENDEAVORS. For some, this may mean competition. For others, it may be an easy morning bike ride or a walk.

If one attempts to build fitness without building health, the ensuing imbalance will result in some breakdown. It is common to see a world class athlete who is very unhealthy, just as it is common to see a healthy individual who is not able to run a marathon. There are many good references citing the classic examples of very fit individuals who have died, many during the course of an easy workout (1-15). One of the most common problems associated with an imbalance between health and fitness is the imbalance of aerobic and anaerobic function. This is described in past papers by the author (16,17,18) and others (26,27,28).

Sheehan (19,20) cites a classic study done at Methodist Hospital in Houston which tested 41 seasoned male marathoners. The five year study, with pre and post stress tests, showed that 18 of the runners

had developed a "positive" stress test, indicating a worsening of cardiac function over that period of time.

Coordination of movement during exercise (which is under nervous system control), fatty acid metabolism (which is influenced by dietary, digestive and hormonal aspects), and many other factors related to exercise have been discussed in other papers by the author (16,17) and are beyond the scope of this paper. The circulatory changes that take place during exercise will be discussed in this paper. These changes have a dramatic impact on the health (as well as the fitness level) of an individual.

BLOOD FLOW CHANGES DURING EXERCISE

It has been shown that the onset of activity, or exercise, is accompanied by shunting of blood to the working muscles from the organs and glands (21-25). Generally, two basic responses occur: (1) There is a sympathetic response affecting the heart and vessels, and (2) there is a vasodilation of the vascular beds in the most active muscles with accompanying vasoconstriction in the non-muscular beds. These changes are due to neurological and hormonal influences.

With the relative vasodilation in the vessels of the working muscles, a higher proportion of the cardiac output goes to these working muscles (21). As a result, less blood flow is available for other tissues. For example, Grimby et al.(29) have shown that renal blood flow will change from 1100 ml. per minute at rest, to only 250 ml. per minute during more intense levels of exercise.

Anderson (24) states that blood flow in the Hepatic-Splanchnic tissue changes from 1350 ml. per minute at rest to 600 ml. per minute

with only moderate exercise. He shows that blood flow to the exercising muscles change from 1000 ml. per minute at rest to 4,500, 12,500 and 22,000 ml. per minute respectively with light, moderate, and maximum exercise.

It can be seen that the cardiac output to all the tissues changes dramatically during activity. When this change occurs too rapidly, it creates measurable changes in muscle function as shown below. When an individual creates this "stress" day after day and year after year, cumulative changes become obvious.

APPLIED KINESIOLOGY EVALUATION

The above information can be applied to patients who exercise at any level. In treating and especially in training many different types of athletes, I have found that the rate at which the shunting of blood takes place is very important. This is what happens in the first stage of any exercise. If the rate is increased too rapidly, a negative response in the body can be seen. It means that if the activity is too rapid, and the heart rate rises too quickly, certain problems can develop. These problems are typically dysfunction of an organ or gland, often with secondary muscular, ligament, and/or tendon injury. Using standard muscle testing, these problems can be shown. For example, if the kidney loses more than half of its blood flow in a very short period of time, this undue stress will typically cause inhibition of the psoas muscle. The biomechanical implications of this are obvious. Many people exercise as if it was only for their muscles. In reality, the muscle response to exercise is relatively minor when compared with the potential benefits derived by

the organs and glands.

It is easy to demonstrate this phenomenon in many healthy and fit individuals and even more easily in susceptible ones (also see Table 1). The first step is to find a muscle or muscles that function normally, being sure that there are no "hidden" problems with the muscle(s). Then check and note the subject's heart rate.

Next, have the subject run in place, ride a stationary bike, or do some other activity which will increase the heart rate to a high aerobic level. As a general rule, you can use 175 minus the person's age to determine the maximum aerobic level for this test. (That is not a good general rule to use for an exercise or training guideline). The heart rate should be increased quickly, so that within one minute you have reached this high aerobic level. Using a heart monitor will simplify this procedure.

After one minute, immediately retest your indicator muscle(s). Most of the time, an immediate weakening will occur because of the rapid rise in heart rate. After two or three minutes, the muscles should be strong again. Next do the same activity, reaching the same heart rate level, but accomplish this over a period of two to three minutes instead of one minute. In most cases this will not cause any weakness of the indicator muscle(s). The difference between the rapid increase and the slower increase seems to be adaptation: The body can easily compensate for a slow decrease in blood flow change, but it can not easily compensate when these changes are too sudden.

This is merely a demonstration. It seems to show what the scientific literature says. In some cases, however, patients who exercise will understand more if they see that not warming up may

cause weakness and undue stress to the body.

Again, it is the rate of increase that is the important factor. Figure 1 is a graph of a typical workout lasting 45 minutes. It plots heart rate verses time. In any exercise, it is essential to slowly increase the heart rate. I use a minimum of 12 to 15 minutes of a slow progressive increase before reaching whatever maximum level that is desired. This is called WARMING UP. It is the safe, slow shunting of blood into working muscles. (Stretching has nothing to do with warming up.) For some individuals or for those who do certain longer workouts, a longer warm-up may be needed. The type of activity during the warm-up may be anything which is controllable. Walking is a good warm-up for many patients.

The last 12 to 15 minutes of this workout are also important, as it is important to slowly re-establish nearly normal circulation without the "pooling" of blood in the muscles. This is best accomplished with a procedure opposite that of the warm-up: the slow lowering of the heart rate. This is called WARMING DOWN.

Figure 1 shows the three stages of a typical 45 minute workout. Letter "a" is the 15 minute warm-up, letter "b" is maintaining a certain level of aerobic or anaerobic function, and letter "c" is the 15 minute warm-down. A 60 minute workout, for example, will still have "a" and "c", but the "b" part would be a total of 30 minutes. A 30 minute workout would have "a" and "c" only.

It could be stated that the health benefits come more from the "a" and "c" part of the workout (the warm-up and warm-down), whereas the fitness benefits come more from the "b" part of the workout. Many patients complain that the warm-up and warm-down are too "easy"

and therefore of no benefit. The information presented here should be explained to patients so they understand the crucial importance of warming up and warming down.

CONCLUSION

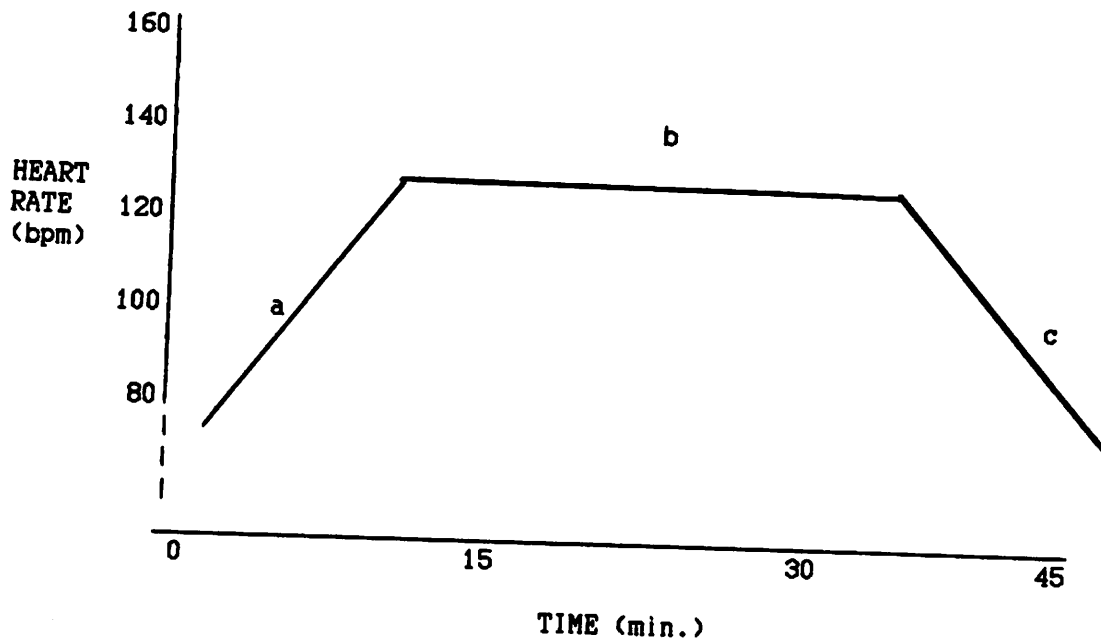
Exercise and activity have generally been considered to be health promoting. Unfortunately, we have seen a trend that is just the opposite: High incidence of injury and illness, and sometimes even death, have been associated with exercise. When blood flow is considered, and exercise is regulated accordingly, many of these problems do not occur. There is no reason why exercise can not be health promoting, a means of increasing fitness, as well as fun. When done properly, which includes warming-up and warming-down, benefits are obtained from exercise, without associated dysfunction.

TABLE 1

1. Test one or more muscles associated with an organ or gland (i.e. sartorius, psoas, etc.). Be sure they are "clear" of all problems.
2. Note resting pulse.
3. Have the subject run in place in order to bring the pulse to a high aerobic level (use 175 minus age). This level should be reached within one minute.
4. Re-test indicator muscles and note any weaknesses.
5. Wait two minutes or more for any weaknesses to dissipate.
6. Duplicate the procedure in #3 above, but take 2 or more minutes to reach the same level.
7. Retest indicator muscles.

The first part of this test creates a rapid shunting of blood from organs and glands to the muscles. This usually will weaken an indicator muscle which is related to an organ or gland. In the second part, when the the heart rate is increased to the same level more slowly, the weakening effects do not take place. [The subscapularis muscle, which is related to the heart, may weaken with any increase in heart rate if there are certain problems associated with the heart (30).] Also be sure there are no structural problems which may cause a general weakening as a result of running in place.

FIGURE 1



FOR EXAMPLE (using a heart monitor):

	<u>a</u>	<u>b</u>	<u>c</u>
<u>total # of minutes spent exercising</u>	<u>monitor beeping < "low"</u>	<u>monitor silent between low & high</u>	<u>monitor beeping < "low"</u>
30	15	0	15
45	15	15	15
60	15	30	15
75	15	45	15
and so on...			

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A STUDY OF THE ROLL TECHNIQUE

By

H. Louis Obersteadt, D.C.

ABSTRACT: The study shows a strong relationship of the Roll technique to leg deficiency, eye position, and sacral challenge.

The Pitch, Roll, Yaw, and Tilt Technique (PRYT), especially the Pitch technique, has been an invaluable asset to my practice since I first saw it demonstrated by Dr. George Goodheart in 1980. Being a Logan Chiropractic College graduate, I was curious if the hip and leg position and eye direction of the roll analysis had a relationship to the short leg. As you may recall, this was originally called the oculo-basic technique.

Procedure:

The patient was checked for leg deficiency prone then supine. The patient was then tested for the PRYT Technique. If the roll part of the PRYT Technique was positive, the patient was instructed to move the eyes to the right then to the left to see which direction negated the weakness of the roll position. Then the patient was tested for respiratory assist (i.e. which phase of respiration negated the weakness). The patient was then

A Study of the Roll Technique

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instructed to move to the prone position and a hamstring was checked for an intact muscle. The sacrotuberous ligament was challenged in a cephalad, lateral, and posterior direction to determine if the challenge would cause inhibition of the intact muscle. When the challenge causes an inhibition of a strong muscle, the patient was asked to move the eye to the right then to the left to determine if the eye challenge would negate the muscle inhibition.

Results of Study:

In a study of 16 patients, I found that 15 of the 16 (94%) had a right short leg prone, and 12 of the 16 (75%) had a short left leg supine. The hip roll challenge position was positive in that it caused muscle inhibition of the intact muscle to the left with 12 of the 16 (75%). The roll position with hips rotated to the left was negated with eye position to the right in 11 of the 12 (92%) patients and one of the 12 with the eye position to the left (8%). There was an inspiration assist in 12 of the 16 patients (75%) and expiration assist with one of the 16 (6%). Three patients had no respiration assist. The sacrotuberous ligament challenge was positive in 16 of the 16 patients (100%). There was 100% agreement to eye position with this challenge and the eye position that negated the roll position. That is, if the right eye position negated the left leg and hip position of the roll challenge, the right eye position would negate the sacrotuberous ligament challenge.

A Study of the Roll Technique

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There appears to be a strong relationship of the eye position to the short leg prone. Of the 15 patients with the right short leg prone, the positive eye challenge was negated with eyes to the right in 13 (87%). There is also a strong relationship of the eye direction and short leg when the hip rotation is to the opposite side.

Conclusion:

In this limited study there seems to be a strong relationship of the leg deficiency, eye position, and sacral challenge. However, I feel that a more indepth study is required to substantiate this study.

ROLL TECHNIQUE

LEG & HIP ROTATION POSITION	EYE DIRECTION	LEG DEFICIENCY PRONE/SUPINE	RESPIRATION IN/EXP	EYE POSIT. WITH SACROTU. CHALLENGE	AGE	SEX
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Left	Right	R	R	I	R	45	M
Right	Right	R	L	I	R	36	F
Left	Right	R	L	E	R	36	M
Left	Right	R	R	I	R	28	M
Left	Right	R	L	I	R	28	F
Left	Right	R	L	I	R	60	F
Left	Left	L	L	I	L	16	M
Left	Right	R	L	- -	R	46	M
Left	Right	R	L	- -	R	57	F
Right	Right	R	L	- -	R	45	M
Left	Right	R	R	I	R	39	M
Left	Right	R	L	I	R	46	M
Right	Left	R	R	I	L	41	M
Left	Right	R	L	I	R	23	F
Left	Right	R	L	I	R	47	M
Right	Left	R	L	I	L	34	F

"The Sleeping TMJ"

by

Gerald J. Polino, D.C.

ABSTRACT

Recent observations by Dr. Goodheart involving N.E.H.T. technique (1) utilizing eyelid position during sleep to uncover anomalies in small intestine absorption has led the author to question how similar applications might be made with other functional disturbances which occur during sleep. Investigation of apparent TMJ dysfunction typified by bruxism was investigated on TMJ patients who had been previously treated and "clear" of therapy localization with eyes closed yielded a significant number of hidden faults which were found under these conditions.

INTRODUCTION

As is becoming more and more apparent in some of the more recent discoveries in Applied Kinesiology, our examination of a patient's problems must often be investigated in circumstances approximating the environment in which the patient functions. This is typified for example by testing a patient for fixations in the sitting, standing, working and sleeping posture in many stubborn or difficult cases. (2)

CASE STUDY

This concept came to light when the author was working with a particularly difficult case involving a 26 year old female patient with primary complaints of awakening with debilitating temporal headaches along with considerable

cervical tension and stiffness. The patient was treated on six occasions with the usual AK procedures including correction of the pelvis, cranials, TMJ in all jaw positions, TMJ muscles, etc. with only limited results. The patient was referred to a Dental TMJ specialist conversant with AK and craniomandibular therapy who observed considerable dental deterioration due to bruxism and fitted the patient with a M.O.R.A. splint. This procedure helped to diminish the intensity of the symptoms to some degree, however, only by approximately 30-40% by the patients estimate.

On subsequent visits the TMJ and cranium appeared to be clear despite the symptoms and exhausting all efforts (B.I.D., E.I.D., R-L brain, etc.) to demonstrate the problem.

The author, following the demonstration of the N.E.H.T. technique at the Washington D.C. I.C.A.K. meeting (1), was performing the technique and explaining the methodology to a colleague while treating him. The other Doctor (3) suggested that a variation of this might be useful on patients where nocturnal bruxism was a factor in treatment of TMJ dysfunction. It was then reasoned that if the patient was asleep while bruxing that testing under the same circumstances should uncover hidden problems.

On a subsequent office visit the aforementioned patient was examined in the usual fashion which was once again non-productive. She was then instructed to therapy localize both TMJs, close her eyes and was once again tested with resultant dramatic weakening on closing, chewing, lateralization and swallowing. The patient was treated in the appropriate manner, only with the eyes closed and released.

On the next visit the patient reported to be considerably improved, was tested and treated in the same fashion (on this occasion showing only a unilateral closing weakness). She was sent back to the Dentist who withdrew the appliance after approximately two weeks of additional treatment involving some minor dental equilibration and released her. On her last visit the patient reported that she was asymptomatic, felt as if she had "more energy than she had in years" and that her husband reported that she no longer was "grinding her damned teeth", a symptom that had previously been unreported.

The author has since been treating all cases where TMJ dysfunction is a factor in this fashion and has been

experiencing an overall improvement in patient response in a shorter time frame with fewer patient visits.

Procedure

- 1) Correct all pelvic, spinal, cranial, acupuncture, glandular; nutritional faults as well as muscular imbalances.
- 2) Test for and treat the TMJ in all phases of mandibular position.
- 3) Once all indicators are abolished, retest completely with the patients eyes closed. In difficult cases test in the patients sleeping position with the eyes closed as well as consideration for referral to a competent Dental TMJ specialist.
- 4) Treat all findings identified in this fashion with the eyes closed in the position found.

The author invites the membership of the I.C.A.K. to scrutinize this procedure and comments on results, refinements discrepancies are welcomed.

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Expanded Applications of the Neuro-Enteric
Holographic Technique (N.E.H.T.)

by

Gerald J. Polino, D.C.

Abstract

The eyelid position utilized in the recently developed N.E.H.T has greatly enhanced small intestine absorption of nutrients ingested both from foods and supplementation. The author has observed many cases where the N.E.H.T. has been of great value in decreasing the quantity of nutrients needed to achieve patient stabilization. In cases where this methodology has produced less than desired results the technique was analyzed as to the various components and an earlier holographic technique(1) learned in an AK seminar taught by Dr. David Leaf(2). This technique, utilizing front and rear brain balancing was integrated with N.E.H.T. with greatly improved clinical results on heretofore resistant and difficult cases.

Introduction

As the volume of information and methodology in Applied Kinesiology expands and improvements are introduced, all too often we fall into the trap of grasping at the newest "gee-whiz" technique of the moment and ignore or forget those which have been equally effective from previous developments. The author has observed disgruntled practitioners who have taken advanced seminars and attempted to implement the procedures without results strictly because they have attempted to "apply the icing before they bake the cake", in other words they ignored the basics and attempted only the new procedures.

Case

A 36 year old male patient presented with multiple digestive and eliminatory problems as well as difficulty walking uphill and climbing stairs. Treatment of the basics (pelvis, cranium, spine, with nutritional supplementation, etc.) had previously greatly assisted in his digestion and elimination but had failed to improve his walking and climbing difficulties to any great extent. These problems persisted despite all efforts utilizing advanced techniques (B.I.D., etc.) to bring out any discrepancies with the muscles or other factors affecting the propulsion mechanism. The patient often remarked that his "legs felt like lead."

Following the presentation of the N.E.H.T. by Dr. Goodheart at a seminar(3), the patient was reevaluated and a remarkable weakening of both quadriceps occurred when therapy localization to the neurolymphatics, small intestine alarm point and neurovasculars was accomplished in the eyes closed condition. The prescribed corrective procedures were implemented, the patient rechecked and released with great expectations. To both of our disappointment the patient returned several days later and reported no change in his condition. The patient was again evaluated under the same

circumstances with much the same findings. It was then that the author recalled a previously taught holographic technique (1) in which the patient was tested in both the eyes open/eyes closed condition as he simultaneously therapy localized the affected reflex, vertebra, etc. and visualized and/or "saw" his problem(1). The correction in this technique was then accomplished by tapping the frontal (visualization) or the occipital (sight) regions of the cranium which demonstrated a positive challenge while the patient had their eyes in the mode (open or closed) which did not weaken the indicator muscle. The author then reasoned that if the eyes closed position used in N.E.H.T. brought out the "hidden" small intestine problem, that this might be a type of frontal bone aberration similar to the "hologram" object beam/reference beam situation described by Dr. Goodheart to describe the previous technique.

The patient was again retested while therapy localizing the quadriceps neurolymphatics with the eyes closed (weakening the quadriceps) and was asked to visualize his low back, upper back, etc. and retested each time. When the patient was asked to visualize his upper leg (quadriceps) the muscle dramatically strengthened. The patient was then asked to open his eyes and "see" his upper legs as the author tapped

the frontal bone at a low frequency (one hertz) and simultaneously worked the reflexes which had been previously identified. The patients femur abduction, which had previously been measured, was then rechecked with approximately 15 to 20 degrees of increased motion. The patient was then released and instructed to return in a few days.

On returning the patient reported that his ability to walk up a grade and up stairs had improved dramatically and that his digestion and elimination had also remained good. The patient was then instructed to gradually reduce his supplementation and return in a four weeks. On two subsequent office visits the patient reported no difficulties and had actually began regime of speed walking without problems.

The author has found this method usefull on a number of patients since, some of whom have strenghtened on some areas far removed from the area under observation and has led to some corrections in previously examined areas which only revealed themselves in certain body positions, postures, etc.

Procedure

1. Clear patient of all structural and cranial faults and balance all reflexes, meridians etc. as well as muscles. Provide indicated nutrition.
2. Test both quadriceps muscles and abdominal muscles in the clear, as 51%ers and correct in the usual fashion.
3. Have the patient therapy localize against all of the reflexes with the eyes closed.
4. If positive therapy localization results against any or all reflexes in this fashion, instruct the patient to visualize the suspected problem and retest. If this does not abolish the positive T.L. (eyes closed) the have him visualize related areas of involvement (be creative) until one is identified.
5. Have the patient open his eyes and "see" the area previously identified and tap the frontal bone at approximately one hertz while activating the appropriate reflex.
6. Retest against the same parameters. Retest a previously measured outside indicator such as femur abduction.

The author invites the membership of the I.C.A.K. to scrutinize this procedure and comments on results, refinements and discrepancies are welcomed.

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- (2) Leaf, D.W.,D.C.; 1983 Basic 100 hour AK Seminar; Santa Monica, California.
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FREQUENCY OF INCREASED SECOND HEART SOUNDS by Robert J. Porzio, D.C

ABSTRACT: A study of 160 patients. Phonocardiograph and interpreted for an increase in the second heart sound (S_2). And to start a data bank of information through the use of the Phonocardiography Acoustic Recorder by Technology Applications Associates, Inc.

Introduction:

As long as I can remember, Dr. Goodheart has talked about the importance of listening, tracing, documenting and measuring anything you can in practice. That however, being in a practice not set up for measuring or documenting is very difficult and frustrating.

The phonocardiograph has given me a simple way to listen and measure at the same time without frustrating myself or my staff and it aids in the diagnosis and proper care of my patients.

The most common finding in our office with the phonocardiograph is an increase in the second heart sound (S_2) compared to the sound produced by the first heart sound (S_1).

The significance of the increased S_2 is hypoadrenia.*^{1,2,3} This has been well documented and accepted.

The cause for this increase of the S_2 in hypoadrenia also has been well documented and accepted*^{1,2,3}. Due to the increase in blood pressure in the lungs or functional pulmonary hypertension*^{1,2} caused by adrenal hypofunction.

Of the 160 patients studied, 100 showed an increase of the S_2 above the normally accepted one-third of S_1 at the pulmonary area and that is 63% of patients seen in our office. Of the 160 patients studied, 60 showed normal S_2 tracings - 37%.

FREQUENCY OF INCREASED SECOND HEART SOUNDS

(2)

The following graphs are blown up photocopies of 10 increased S_2 tracings and 6 normal which is the same ratio of increased S_2 to normal S_2 we see in our office.

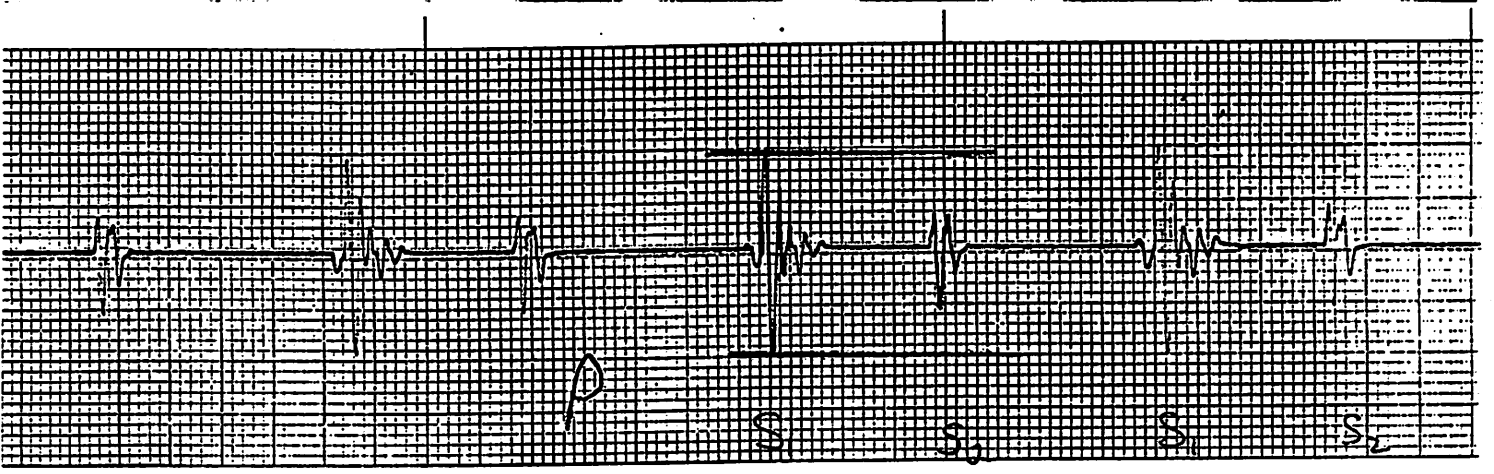
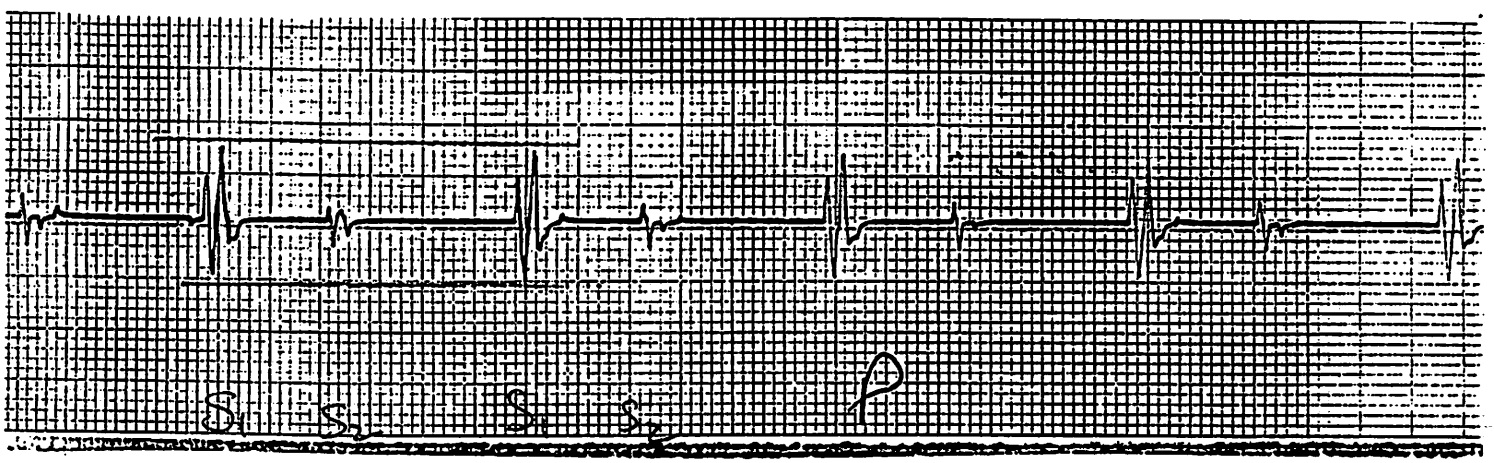
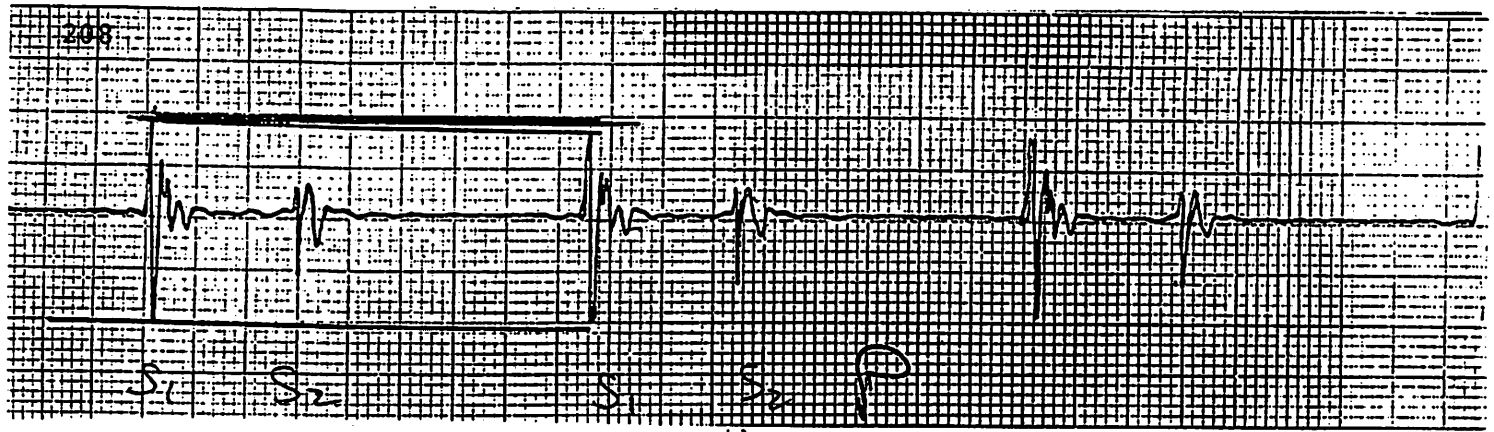
CONCLUSION:

An increased S_2 is very significant in the diagnosis of a patient's health problem and the common occurrence of an increased S_2 in our office in 10:6 or 60% of all our patients.

*1 George Goodheart - Reprints - Research Paper, 1964

*2 Schmitt - The Use of Phonocardiograph in identifying functional problems
(collected paper ICAK 1987, pg 381

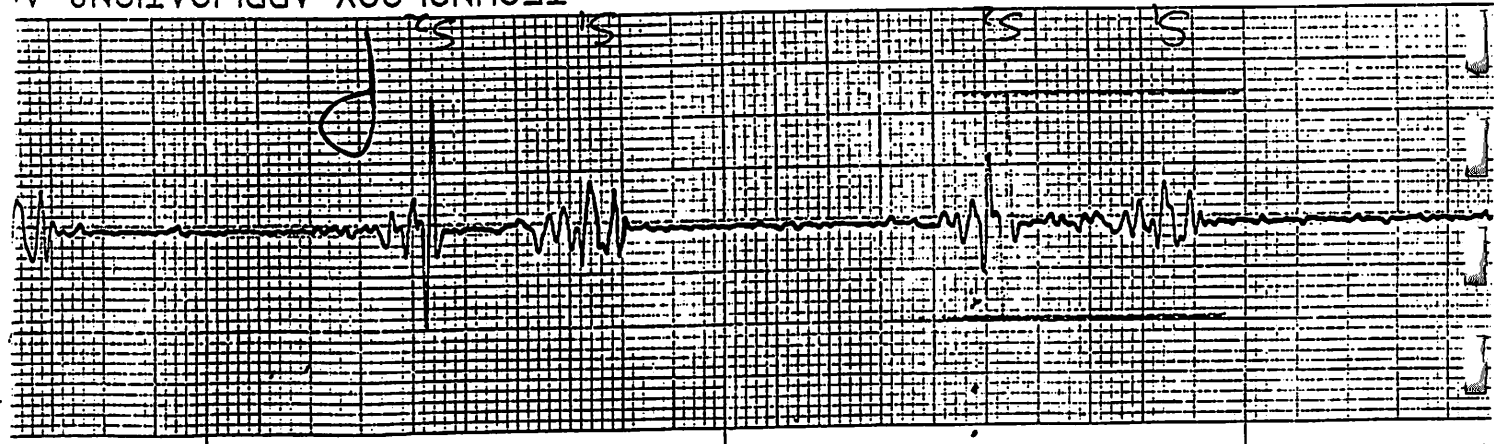
*3 Schmitt. Common Glandular Dysfunctions in the General Practice pg. 37



3 Normal S₂ phonocardiographs

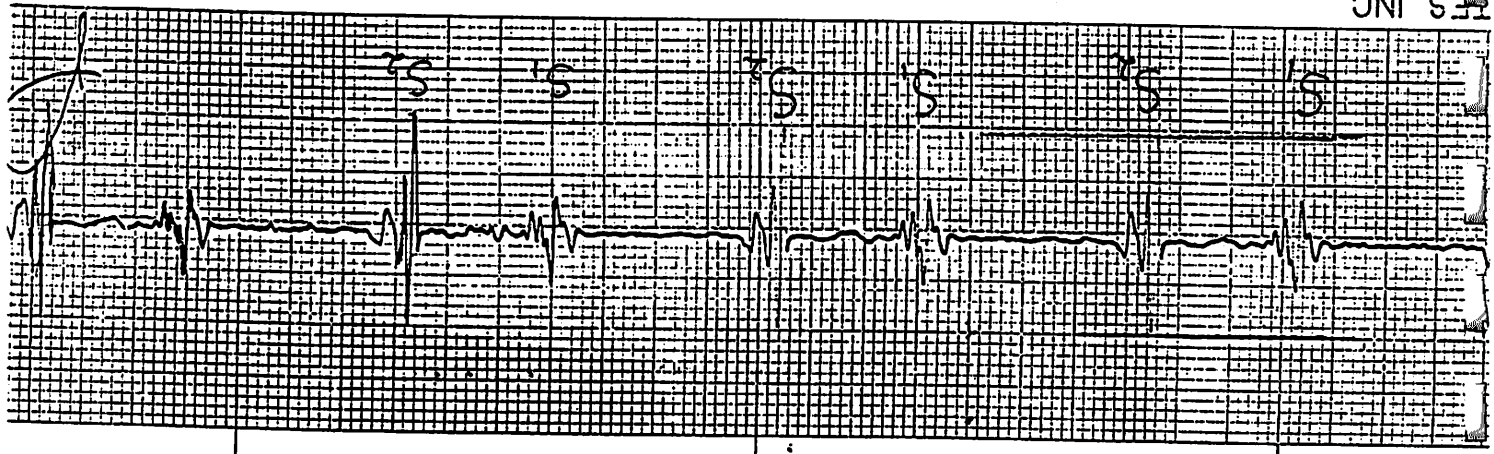
3 Increased S_2 phonocardiographs as compared to S_1

TECHNOLOGY APPLICATIONS A.

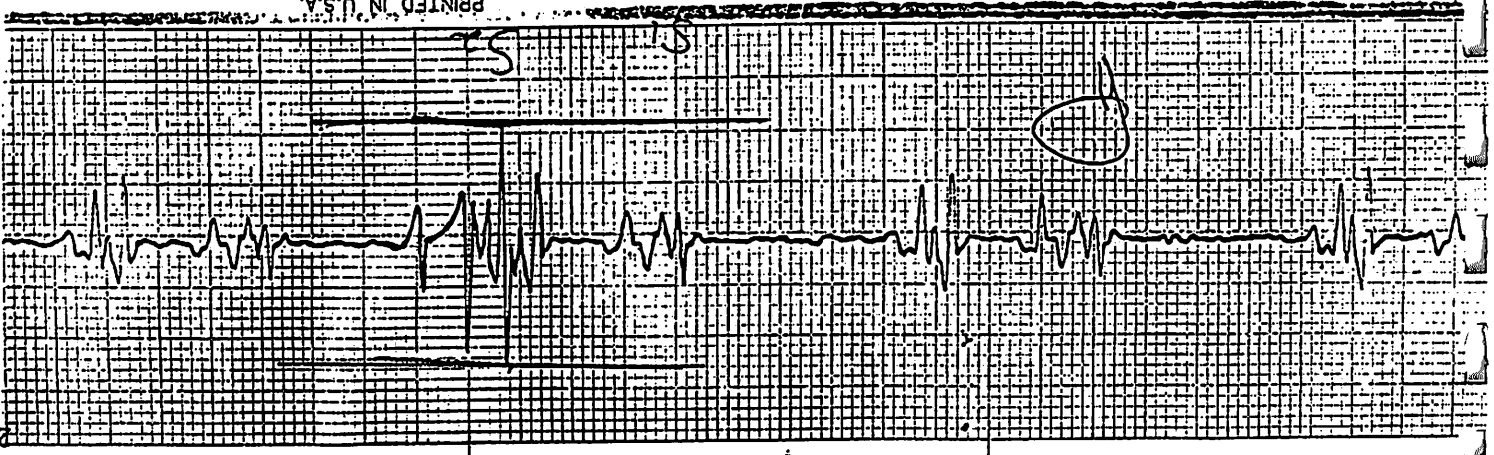


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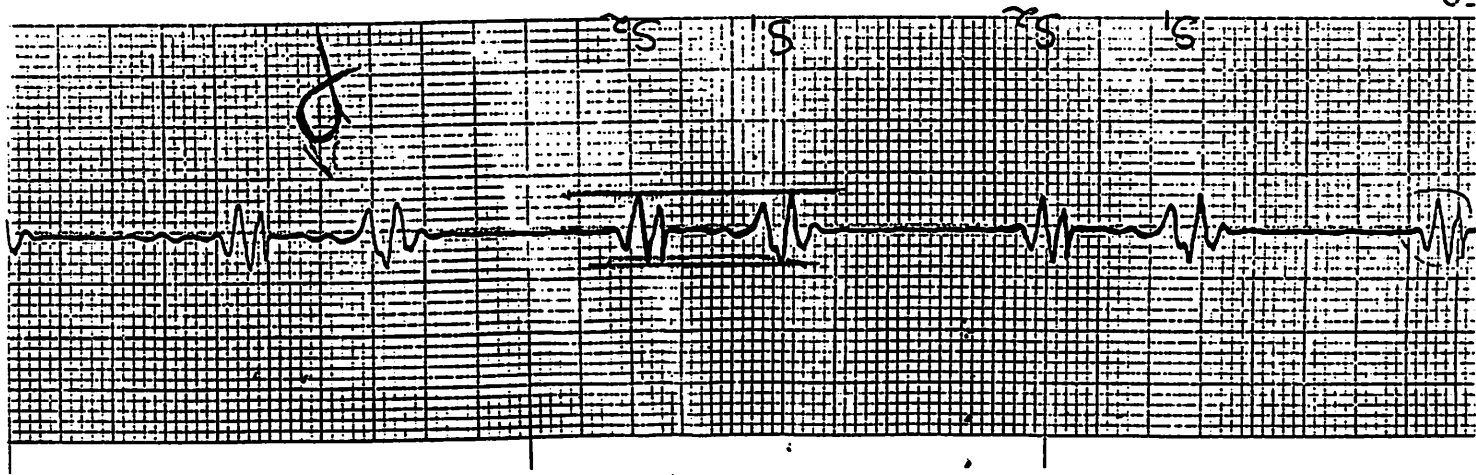


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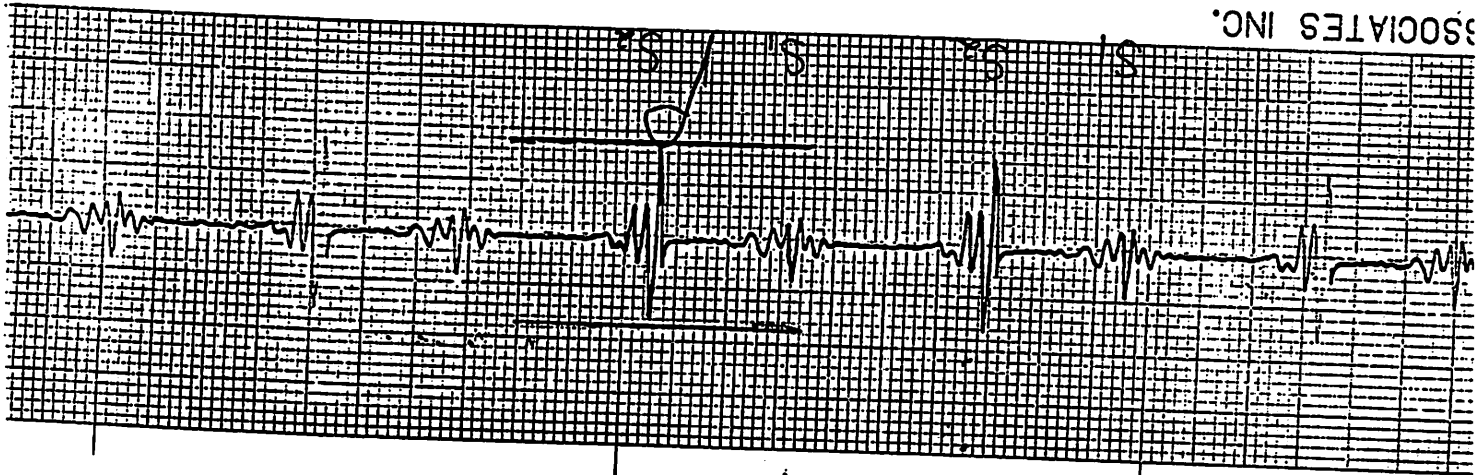


3 Increased S₂ phonocardiographs as compared to S₁

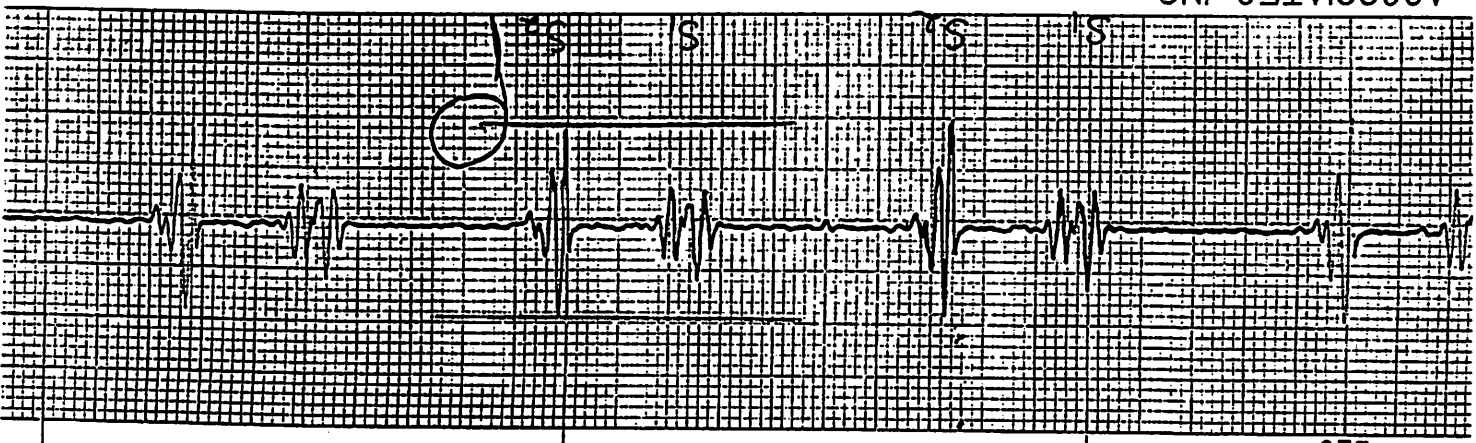
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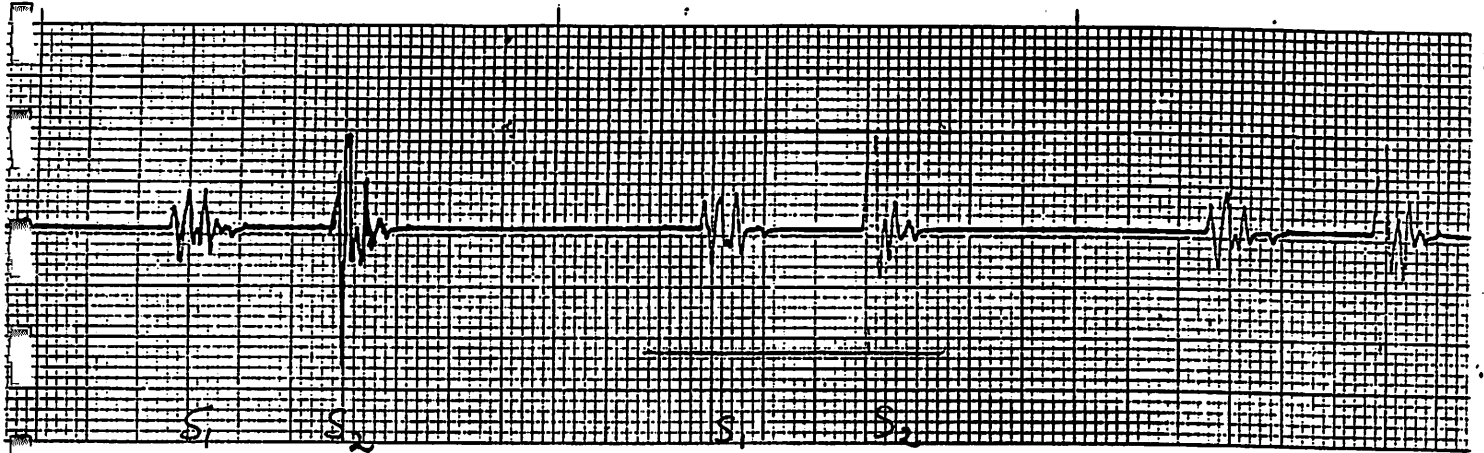
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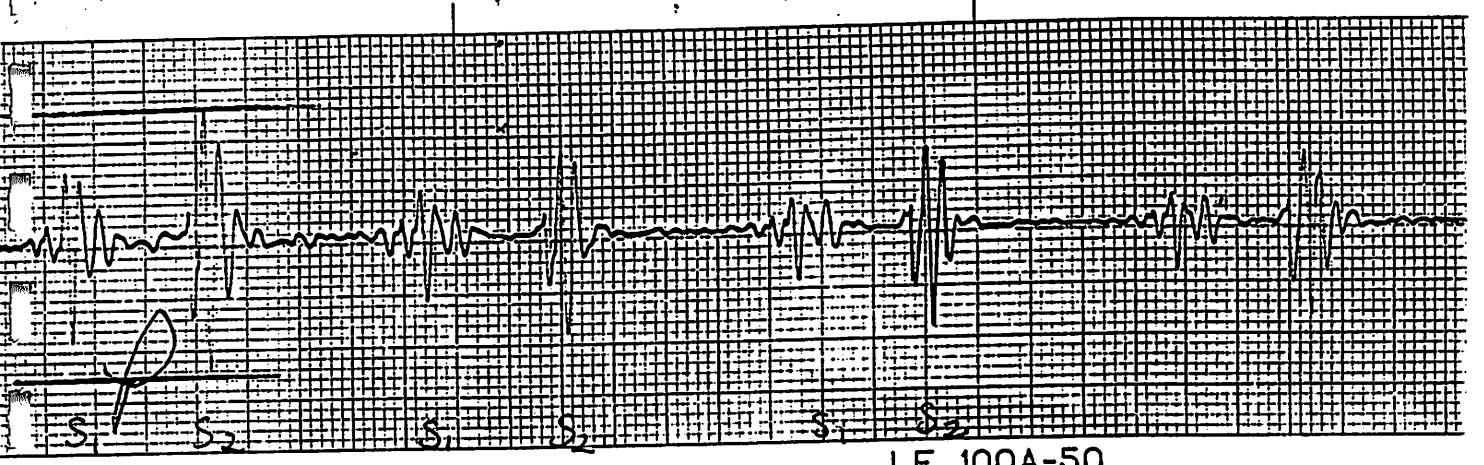
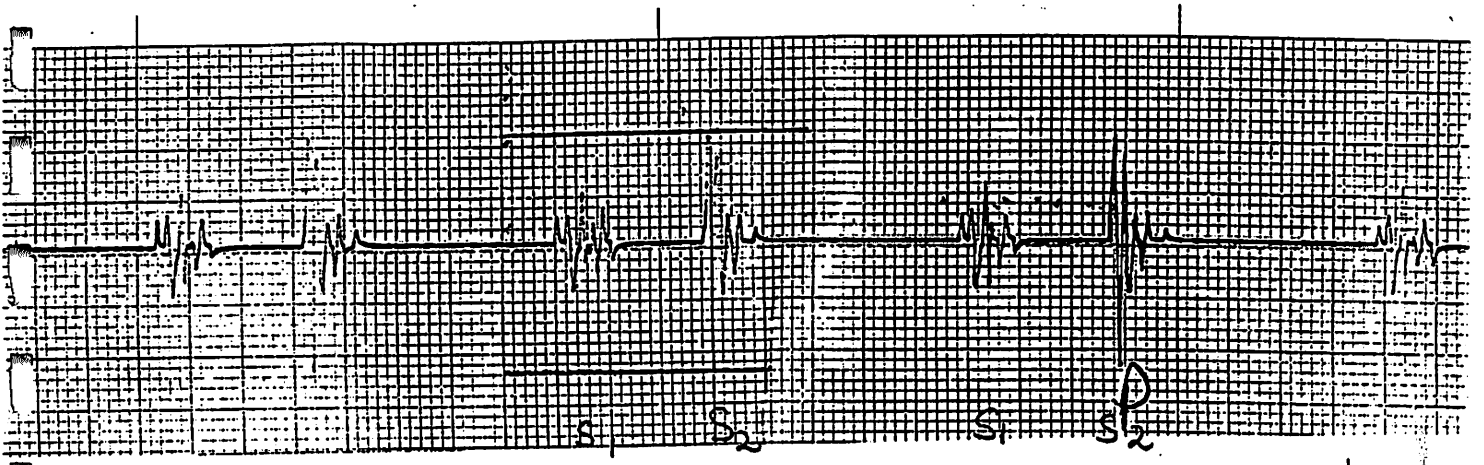
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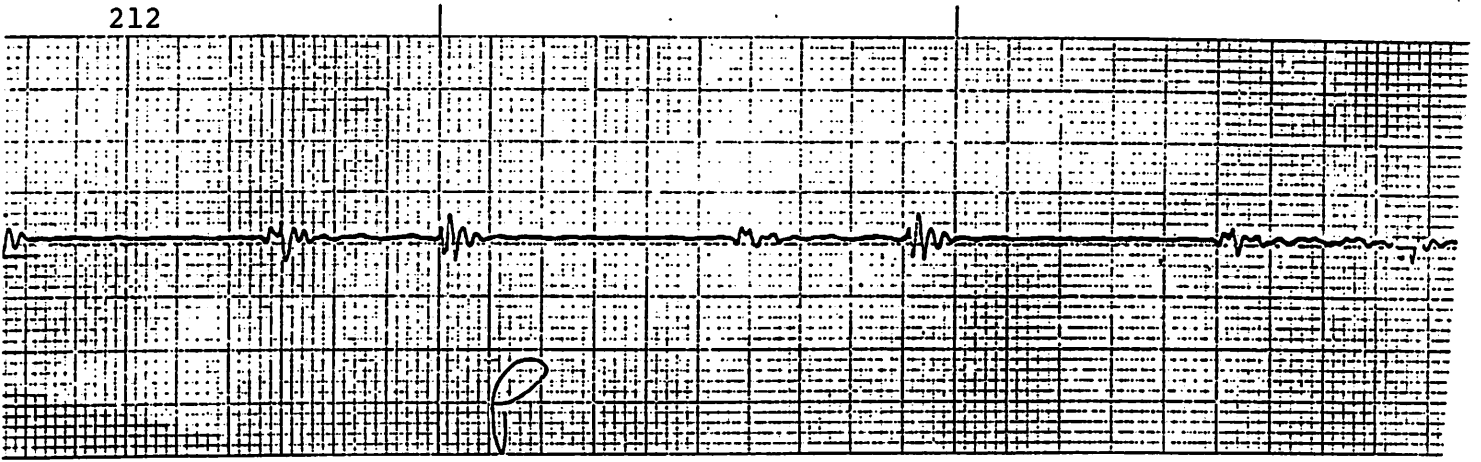
TECHNOLOGY APPLICATIONS ASSOCIATES



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3 Increased S₂ phonocardiographs as compared to S₁

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1 Increased S₂ phonocardiographs as compared to S₁

AN INVESTIGATION OF APPLIED KINESIOLOGY'S MANUAL MUSCLE TESTING
BY THREE DIMENSIONAL COMPUTERIZED FORCE-PLATE ANALYSIS

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ABSTRACT An investigation of manual muscle testing through the use of a three dimensional computerized force plate is presented and discussed. Subjects were selected from a population of tennis players that had a history of knee injury and still complained of chronic knee pain and/ or dysfunction. Some subjects had undergone knee surgery, others had not. Subjects were prescreened and those that showed knee related muscle weakness with apparent dysfunctional neuromuscular spindle cell activity of the same muscle as demonstrated by manual muscle testing and therapy localization were selected. Manual muscle testing was done on the " weak " muscles before and after subjects received Applied Kinesiology muscle proprioceptor procedures in an attempt to normalize the dysfunctional neuromuscular spindle cell activity and thereby strenghten the involved muscle. The three dimensional force plate was used because it simultaneously measures changes and shifts in the forces exerted by the examiner and the muscle being tested.

INTRODUCTION-In November of 1986 the author was given the opportunity to participate in a research project partially funded by the International College of Applied Kinesiology at the Coto Research Center in Coto de Caza, California. This project was particularly attractive because Vic Braden of Coto had been impressed by some of the clinical results the author had achieved utilizing Applied Kinesiology procedures and was genuinely interested in further investigating these procedures through objective means. We had discussed the results and questions brought forward by Blaich (1) and Blaich and Mendenhall's investigation of manual muscle testing with the Cybex II dynamometer (2) and looked for a new perspective and approach. Gideon Ariel (Coto's director of research) suggested the use of the computerized force plate as an objective measurement of the examiner's forces as well as the muscle being tested.

MATERIALS AND METHODS- A highly sensitive computerized force plate was utilized as a platform base for the examiner to stand on while performing manual muscle testing. Testing and measuring were done on initially weak muscles (as demonstrated by manual muscle testing) before and after " neuromuscular spindle cell" (3) procedures were utilized in an attempt to restore strength to the weak muscle. Involved spindle cell areas were located by palpation of abnormally tense muscle tissue in the belly of the involved muscle and by therapy localization. Therapy localization is a process of having the subject touch the suspected muscle area with their own hand while the examiner retests the involved muscle to determine if the muscle contraction is momentarily changed (either weakened or strengthened) by the subject's touch. The theory is that energy is either added to or subtracted from the involved area when touched by the subject's own hand. A temporary change in muscle function when therapy localization is applied indicates that the area should receive specific treatment procedures to normalize function in the involved area. In all cases, the involved spindle cell areas palpated by the examiner closely correlated with those located by subject therapy localization. In a few instances, therapy localization assisted the examiner to pinpoint abnormal neuromuscular spindle cell activity in a large generally involved muscle belly.

Subjects were instructed to resist the examiner's force as he attempted to manually test the strength of the initial concentric contraction of the involved muscle. The examiner made every

effort to have the testing procedures performed very carefully reflect a mutual and simultaneous initiation of force by examiner and subject. Also, the examiner made every effort to perform accurate and unbiased manual tests. Manual tests were performed sometimes with the standard two handed, accepted Applied Kinesiology testing procedure which allows for muscle stabilization and sometimes while utilizing only one hand in an attempt to eliminate the variable of forces exerted by the examiner's stabilizing hand. The examiner had no awareness of the results of the testing while the tests were being performed.

Computers measured vertical, lateral, and A to P forces on a time line during each manual muscle test. Forces were measured in pounds and are reported to the closest 1/10 of a pound. Time was measured in approximate seconds and is reported to the closest second.

RESULTS- the first test was performed on a weak left biceps femoris using the two handed testing procedure (one hand stabilizing the biceps femoris and one hand on the ankle exerting a force to test the muscle). The measurements were as follows: Vertical force (in others words the examiner vertically lifting off the force plate) was - 35.5 lbs at peak contraction in 6 seconds. Lateral force (the examiner moving laterally) was - 16.8 lbs. at peak contraction in 6 secrnds. A-P force (the examiner moving posteriorly or anteriorly) was +13.1 lbs in 6 seconds.

seconds.

A separating force in the muscle belly at the involved neuromuscular spindle cell area (to strengthen the weak muscle) was then performed and the testing repeated. This time vertical force measured -52.8 lbs in 5 seconds. Lateral force was - 14.8 lbs. at 5 seconds. A to P force was + 17.2 lbs. at 5 seconds.

The spindle cell area on the same biceps femoris was then "turned down " to once again create a "weak" muscle as demonstrated by manual muscle testing. Testing and measurements were then resumed. This time though only one hand was used to test the muscle and stabilization was not performed. The vertical force was - 12.3 lbs at 5 seconds. The lateral force was -22.5 lbs. at 5 seconds. The A to P force was + 18.4 lbs at 5 secs.

The spindle cell area was then " turned up" to strengthen the muscle and the test repeated. The vertical force was + 28lbs. at 5 seconds. The lateral force was - 25 lbs. at 5 seconds. The A-P force was + 10lbs. at 5 seconds. (see graph page # 1)

The next test was performed on a different person. All five readouts were performed using two hands to test so that the examiner could stabilize the muscle being tested. The weak muscle being tested was the semimembranosus. The vertical force was - 46.4 lbs. at 7 seconds. The lateral force was + 11.8 lbs at 7 seconds. The A-P force was + 7 lbs at 7 seconds.

After spindle cell procedure was performed on the weak semimembranosus in attempt to strengthen it, the vertical force was - 56 lbs at 5 seconds. The lateral force was - 3 lbs at 5 seconds. The A-P force was approx. - 10 lbs at 5 seconds.

After spindle cell procedure to again " turn down " the spindle cell to again weaken the muscle, vertical force was - 47.5 lbs at 2 seconds. Lateral force was + 12 lbs. at 2 seconds. A-P force was + 5 lbs at 2 seconds.

Spindle cell procedure to once again strengthen the muscle was then performed. This time vertical force was -56.2 lbs at 4 seconds. Lateral force was 1 lb. at 4 seconds. A-P force was approx. 0 lbs at 4 seconds.

The examiner then requested one more readout on the same muscle after having found and stimulated an active posterior neurolymphatic reflex for the same hamstring muscle. This time the vertical force was - 59.9 lbs. at 5 seconds. The lateral force was approx. 0 lbs at 5 seconds. The A-P force was approx. + 10 lbs at 5 seconds. (see graph page # 2)

A third person was then tested. All tests were performed with two hands. The first test was on a psoas muscle. Vertical force was - 27.8 lbs. 3 seconds. Lateral force was + 12lbs at 3 seconds. A-P force was approx. + 4 lbs at 3 seconds.

Spindle cell procedure to strengthen the muscle was then performed and the muscle retested. Vertical force was -38.7 lbs. at 3 seconds. Lateral force was + 5 lbs. at 3 seconds. A-P force was + 5 lbs. at 3 seconds. A "random " neurolymphatic procedure (necessity undetermined) was then performed. The results were vertical force - 36.1 lbs. at 2 seconds. Lateral force was + 5 lbs. at 2 seconds. A-P force 5lbs. at 2 seconds.

A weak rectus femoris was then tested on the same person. Vertical force was - 47.7 lbs. at 7 seconds. Lateral force was + 40 lbs at 7 seconds. A-P force was + 5 lbs. at 7 seconds.

Spindle cell technique was then performed to strengthen the muscle. Vertical force at peak contraction was - 48.1 lbs. at 5 seconds. Lateral force was + 10 lbs. at 5 seconds. A-P force was + 20 lbs. at 5 seconds. (see graph page #3)

The following table summarizes the muscle testing performed using the above two handed testing technique (one hand to stabilize the appropriate joint while the other hand applies the force).

The vertical force appears to be the force of interest, with the lateral and A-P forces having only a secondary importance in the results. The table shows the average and standard deviation values for all three forces both before and after the spindle cell technique was applied. The standard deviation in the initial muscle strength is attributed to expected differences between individuals and different muscle groups on the same

individual. The interesting point to note here is the increase in the average strength with no increase in standard deviation (in fact there was a slight decline in deviation). This indicates that the muscle strength increase is relatively uniform from one individual to another and the average increase of almost 10 pounds (or approximately 25%), therefore, is a meaningful measure of the group performance as a whole. If the standard deviation of the strengthened muscle values was large, then the average increase, though about 25% as stated earlier, might have been due to one or two individuals exhibiting a large increase as opposed to the entire group showing a more or less uniform increase.

SUBJECT	BEFORE TREATMENT			AFTER TREATMENT		
	VERT. FORCE	LAT. FORCE	A-P FORCE	VERT. FORCE	LAT. FORCE	A-P FORCE
NO. 1	- 35.5	-16.8	13.1	-52.8	-14.8	17.2
NO. 2	- 46.4	11.8	7.0	-56	- 3.0	-10.0
NO. 2A	- 47.5	12.0	5.0	-56.2	1.0	0
NO. 3	- 27.8	12.0	4.0	-38.7	5.0	5.0
NO. 3A	- 47.7	40.0	5.0	-48.1	10.0	20
MEAN	- 40.98	11.8	6.2	-50.36	-0.36	6.44
STANDARD DEVIATION	8.01	17.9	3.29	6.52	8.41	11.08

NOTE: (A) AFTER MUSCLE TURNED UP AND BACK DOWN
(B) DIFFERENT MUSCLE ON SAME PERSON

All further tests were done with the one handed testing procedure. Graph pages # 4 & 5 are the results of those tests. The results of these last tests are not reported here. The reason for this is given in the following conclusion and discussion section.

CONCLUSIONS and DISCUSSION-It is interesting to the author to note that every one of the spindle cell procedures performed to increase muscle strength resulted in a significant increase in the examiner vertically lifting off of the force plate during two handed testing. This seems to mean that the muscle's ability to lift the examiner vertically off the force plate increased after spindle cell procedures. Using the first person tested as an example, there seemed to be a 17.3 lbs. increase in the hamstring's ability to resist the examiners vertical force with no equally significant shift in lateral or A-P forces in the first spindle cell procedure performed.

There seemed to be a 9.6 lbs vertical force increase in the second person tested with more shift in the lateral and A-P forces. The third person tested showed a 10.9 lbs. vertical force increase with apparently significant changes in the lateral and A-P forces. It is presently undetermined how much changes in lateral and A-P forces alter this seemingly positive vertical result. This was the first time this equipment was used in this way so the researchers were also pondering how to interpret these other forces.

It is also interesting to note that there seemed to be a great

deal of consistency in the results when testing the second person before and after spindle cell procedure, then turning the spindle cells down again, then up again. The initial vertical force was - 46.4 lbs. After spindle cell procedure to strengthen the muscle the vertical force went up to - 56 lbs. of force. When the spindle cell was turned back down the vertical force was - 47.5 lbs. which was only a 1.1 lbs. different from the original pre-treatment test. After the second spindle cell strengthening procedure, the vertical force went back up to a - 56.2 lbs. This was only .2 lbs. different from the previous post-treatment positive result.

The results of the one handed testing were quite erratic and seem to reinforce the necessity of two handed testing to insure accurate muscle stabilization. It was apparent to the examiner that repeated one handed testing was clearly unstable and extremely fatiguing to the examiner's triceps and posterior deltoid muscles. Utilizing one hand, the examiner repeatedly experienced initiating a test to determine the strength of a specific muscle only to have the subject substitute a stronger muscle to take over the test. For this reason, the examiner thinks graphs 4 and 5 are insignificant and noteworthy only to reinforce the need for accurate muscle stabilization during manual muscle testing. This necessitates the use of two hands.

Perhaps future studies could include the use of a force transducer between the examiner's stabilization hand and the

subject's body to quantify the force exerted by the stabilizing hand.

It seemed clear to the examiner that some of the drops in the graph that signaled the end of a test were sometimes initiated by the subject's muscle fatiguing first and sometimes initiated by the examiner's muscles fatiguing first. The examiner's subjective experience was that when the patient's muscle was "strong", the examiner's arm fatigued before the subject's muscle did. When the subject's muscle was "weak" it fatigued before the examiner's arm did. As far as the examiner presently knows, the force plate is unable to detect which muscle fatigued first initiating the end of the test. That is one reason that it is not presently known how to assess the significance of the time factor in these tests. One question to ponder is whether it is an advantage for a muscle to reach peak contraction quickly or over a longer period of time? This may be an advantage in some sports and a disadvantage in other sports. If this is the case, it is possible that neuromuscular spindle cell technique could be helpful not only in muscle dysfunction but in fine tuning prime mover muscles with their antagonists, synergists, and fixators to enable an athlete to perform a specific action eg. the quick muscle contraction of place kicking in football.

As a side note, it seemed that when a neurolymphatic reflex point was treated with its necessity verified through therapy localization, it enhanced muscle function. When it was done

randomly it seemed to detract from muscle function. This may support the premise that no procedure should be done without a clearly verified need.

It is presently difficult to interpret all the variables in these testing procedures. What we now know is that it is possible to measure the three dimensional forces in manual muscle testing superimposed on a time line. This seems to open many possibilities for further learning. What does seem apparent is that something is going on that seems to be quite measureable if we can define our parameters and what it is that we want to quantify.

Perhaps the real value of this study is that it may provide a fresh look at what it is that we are truly attempting to quantify. Perhaps it may even allow us to more clearly see and define the parameters that we are trying to objectify. It now seems valuable and essential to be able to measure shifts in the examiner's body weight. It now seems that it is just as important to know what is going on in the " testor " as the " testee ". This appears to be essential if we want to truly quantify manual muscle testing as performed by a person (which is what most practitioners do in their offices). Most of us have experienced a " biased " testor consciously or unconsciously changing the parameters of their testing procedures to " prove " their point. That is what our detractors think that we do all the time. Quantifying the doctors forces in the test now seems as

important as quantifying the muscle forces.

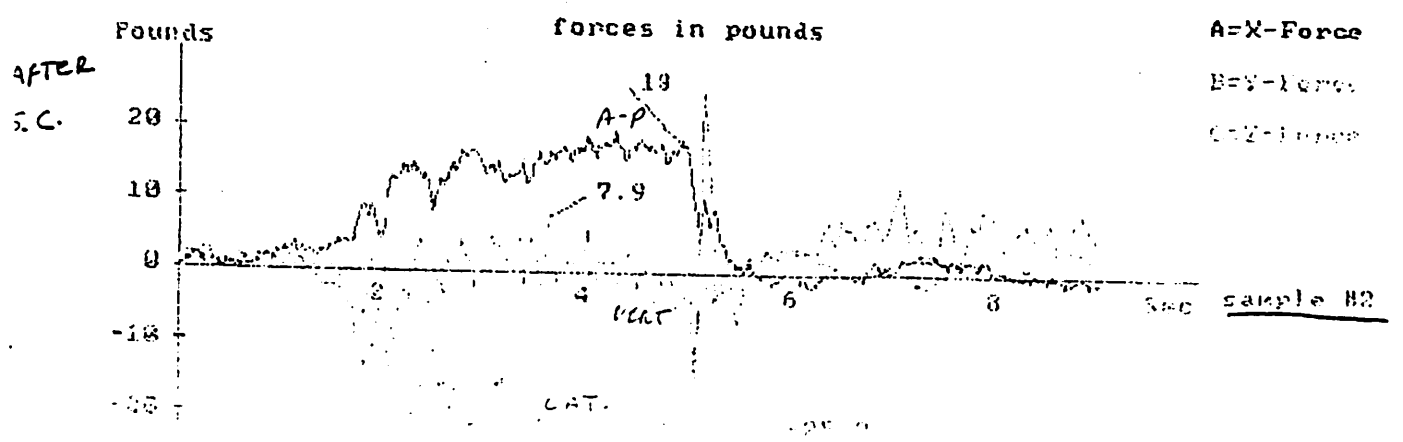
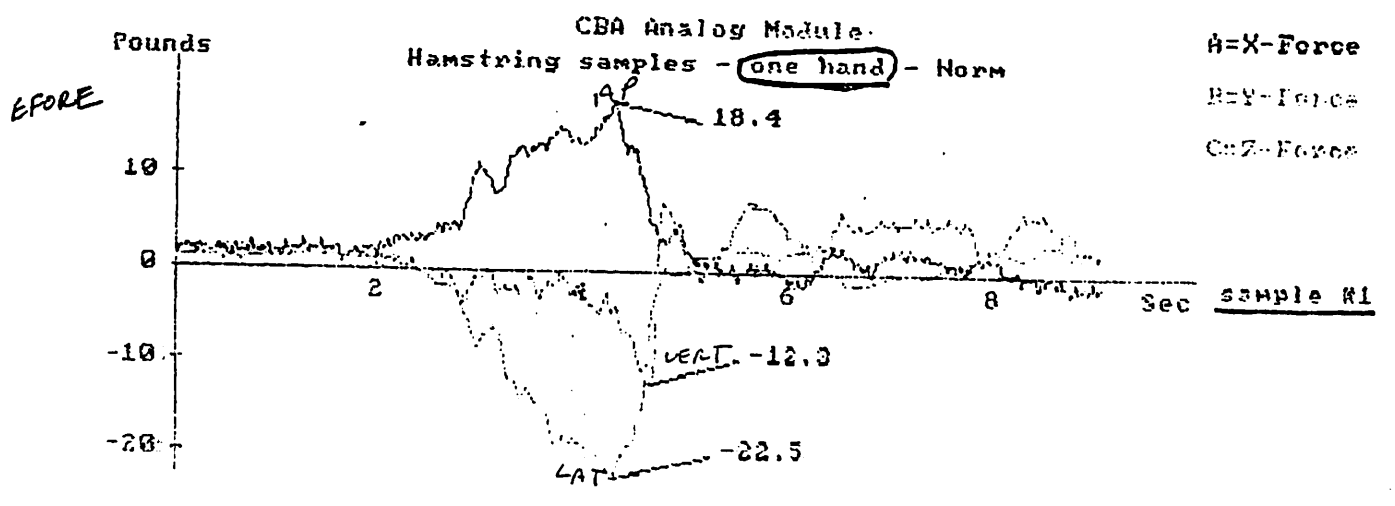
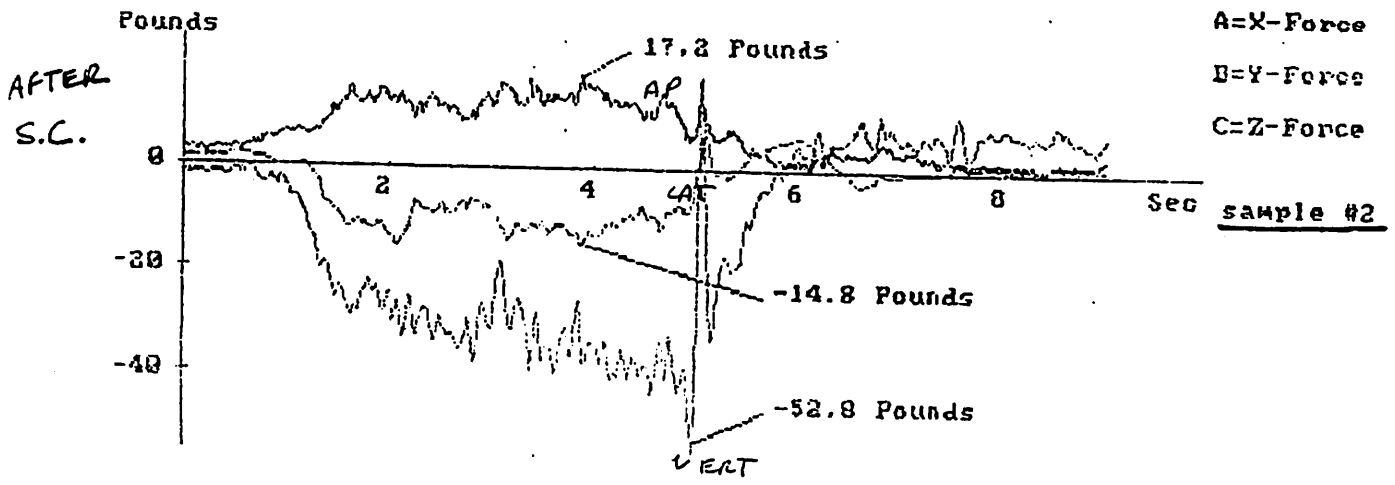
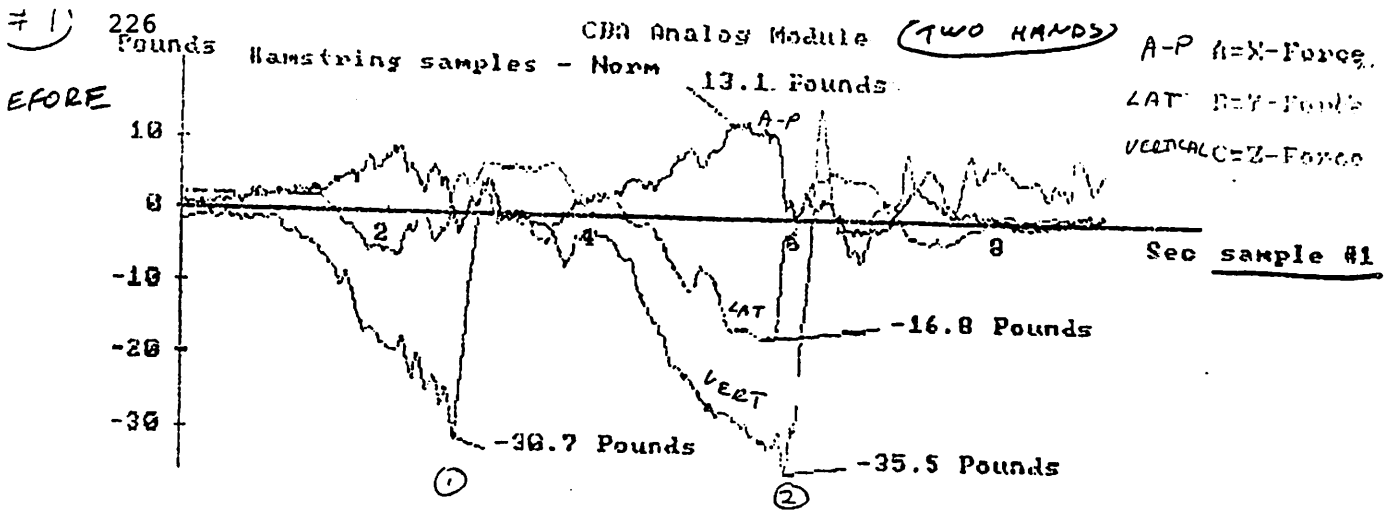
It does seem to me that the three dimensional force plate measurements might be the technological breakthrough for which we have been looking to truly quantify manual muscle testing because the forces of the doctor and patient are apparently measured at the same time. A great deal more familiarity with the equipment and parameters would be necessary to know this for sure, but this first look does seem promising.

Vic Braden had originally cautioned that a pilot study tends to ask more questions than it answers. That certainly seems to be true of this apparently fruitful study. The two that I now ask myself are 1) Can the benefits of Applied Kinesiology procedures be quantified by the use of some present or future objective technology that is able to measure positive changes in muscle without a human doing the testing? and 2) Can manual muscle testing performed by a human be objectified and quantified by computerized force plates or some other present or future technology?

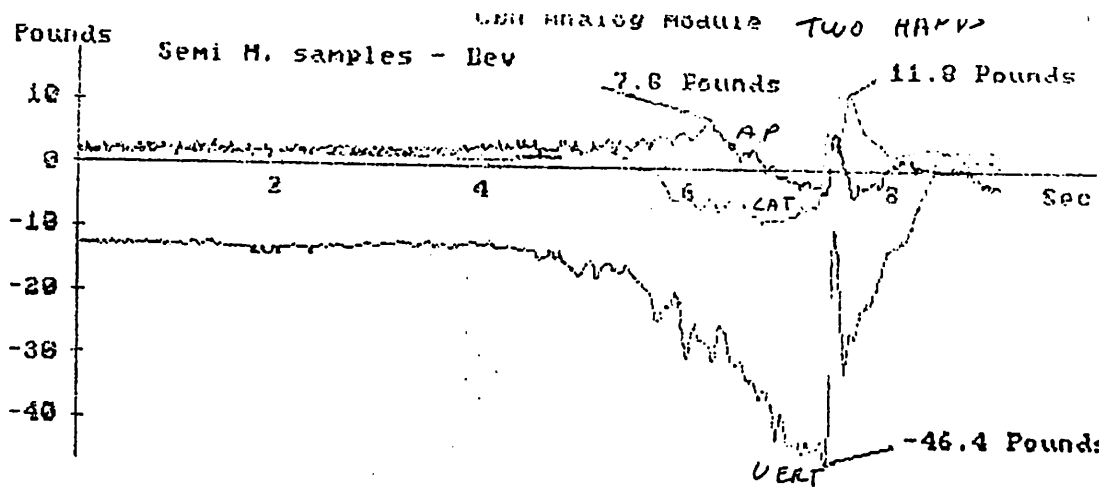
Since Blaich and Mendenhall's paper may have been a necessary precursor to Schmidt's clarifying the use of doctor vs patient initiated testing as it relates to the gamma system (4), I am hopeful that the questions asked by this project will stimulate similar fruitful thinking and results.

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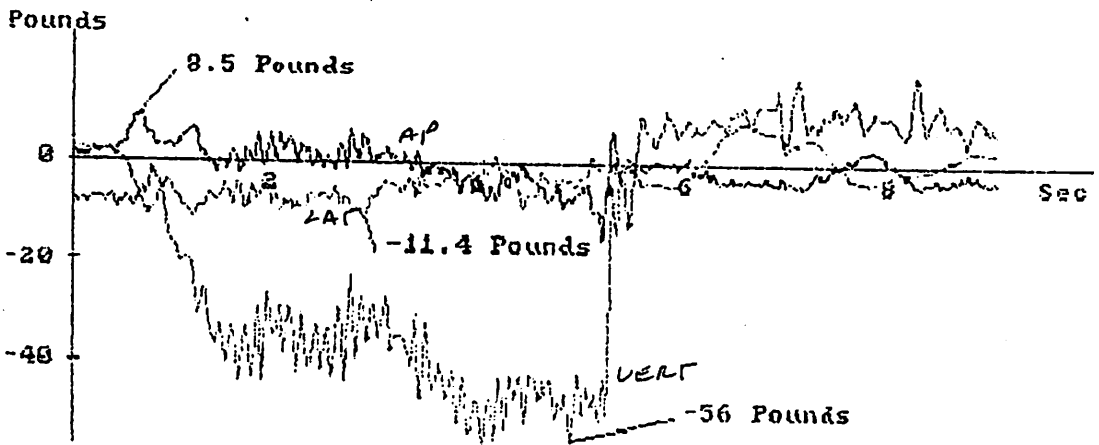


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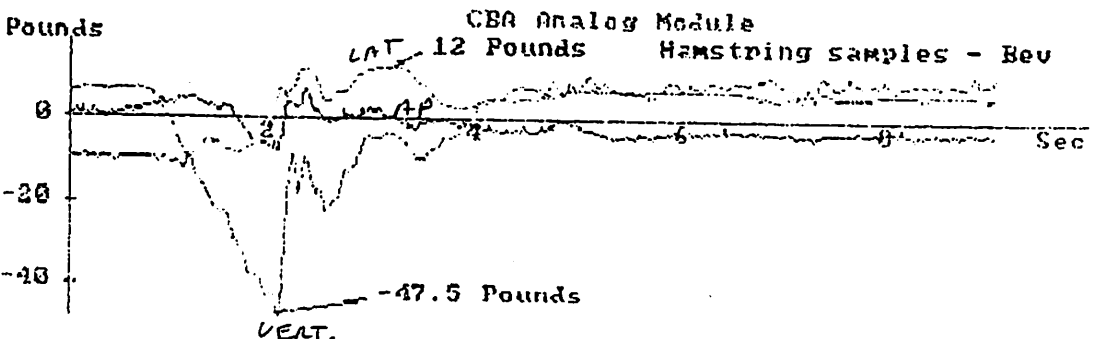
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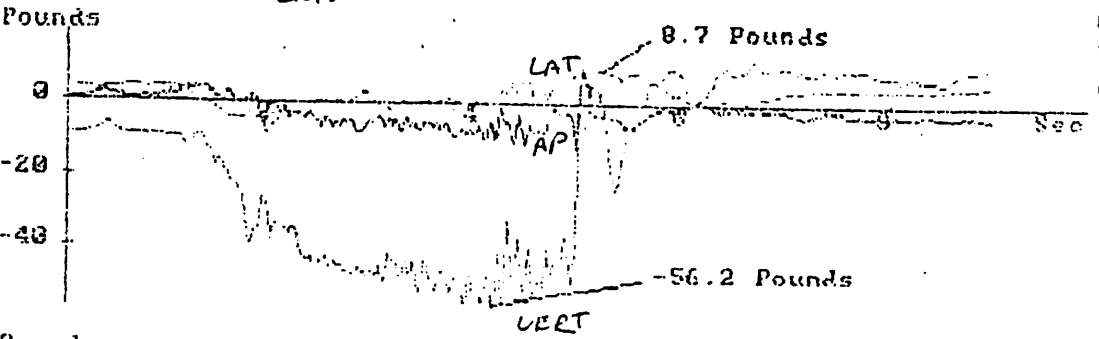
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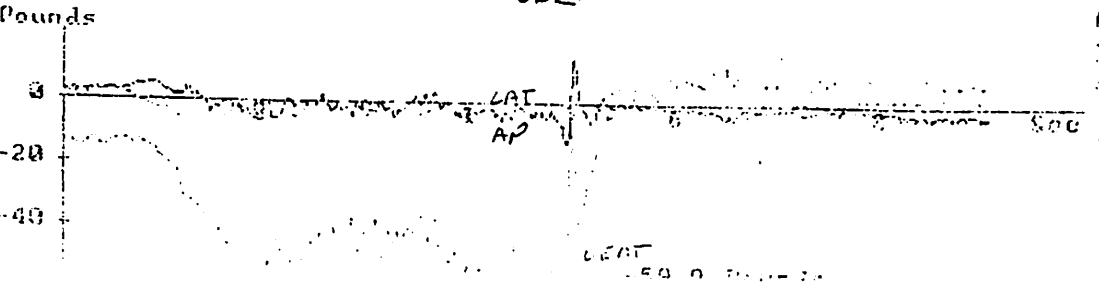
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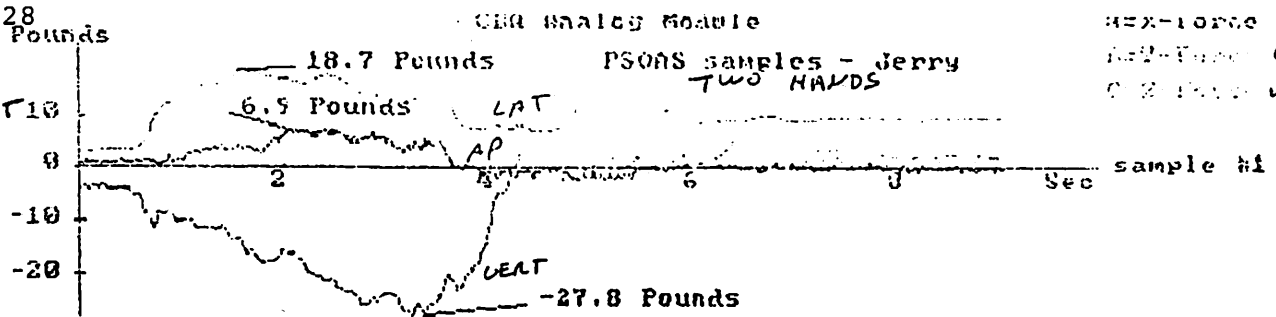
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TER
IV.L.



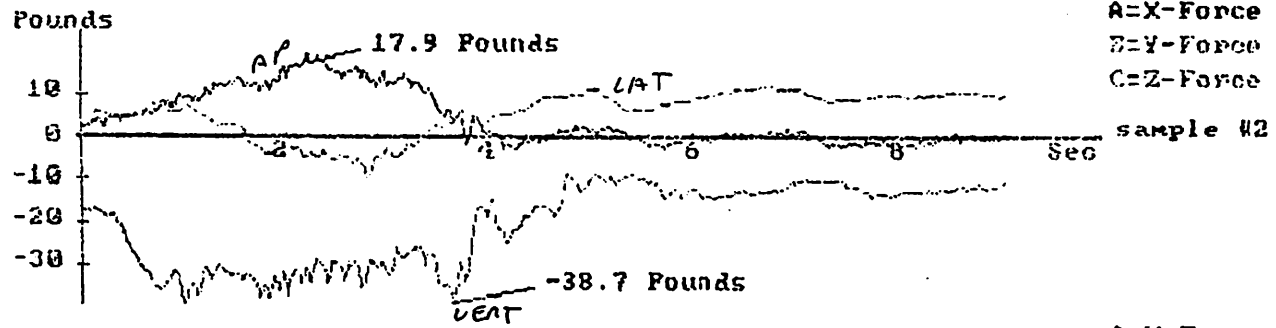
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#3
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 TREATMENT



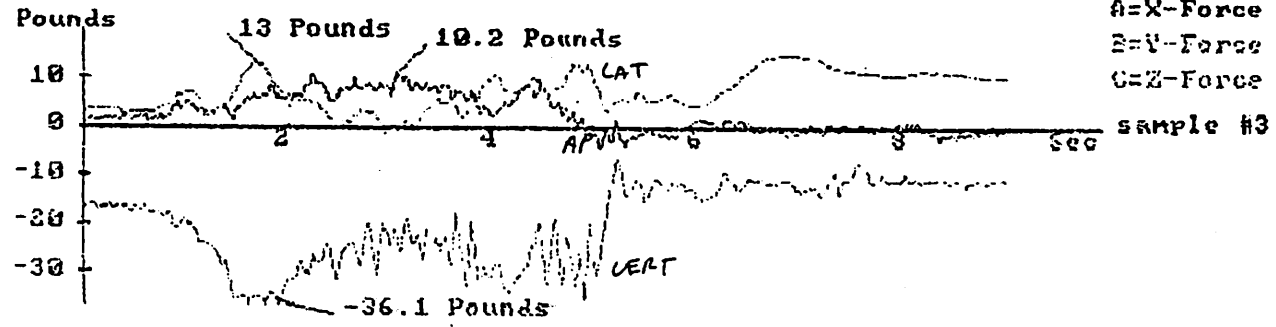
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AFTER
 S.C.



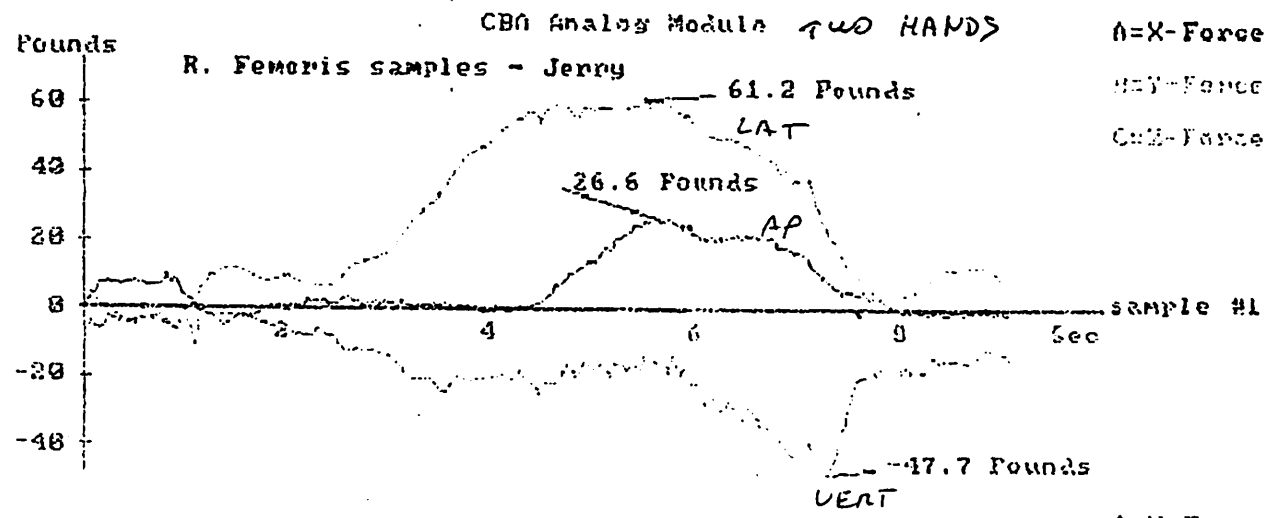
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AFTER
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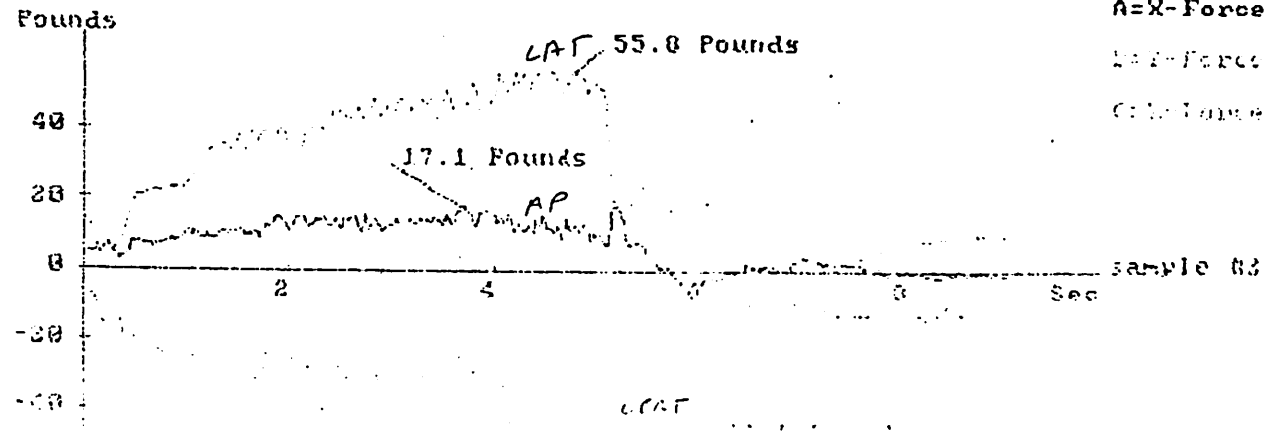
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BEFORE
 RX



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AFTER
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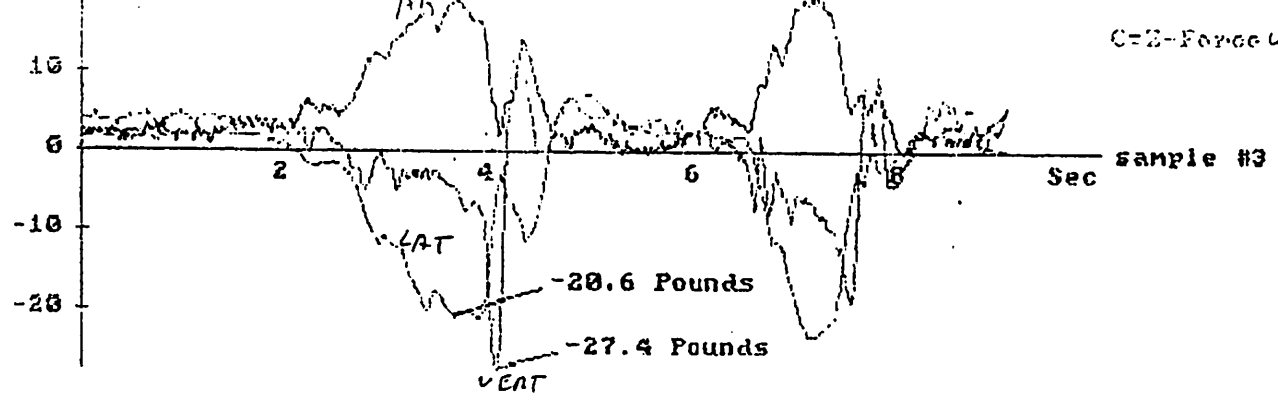


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 C=Z-Force

#4) Pounds

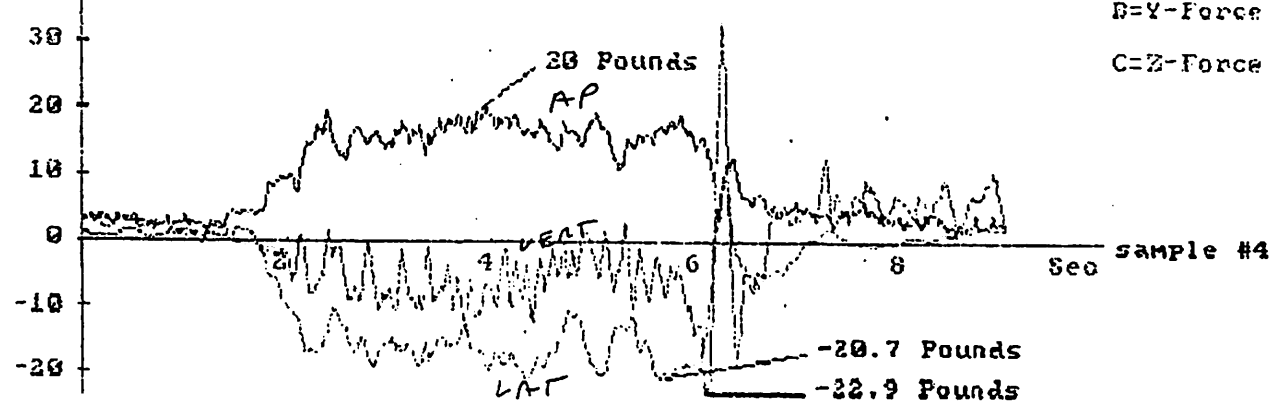
CBA Analog Module
Hamstring samples - one hand - Norm
19 Pounds

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B=Y-Force LAT
C=Z-Force VEAT



Pounds

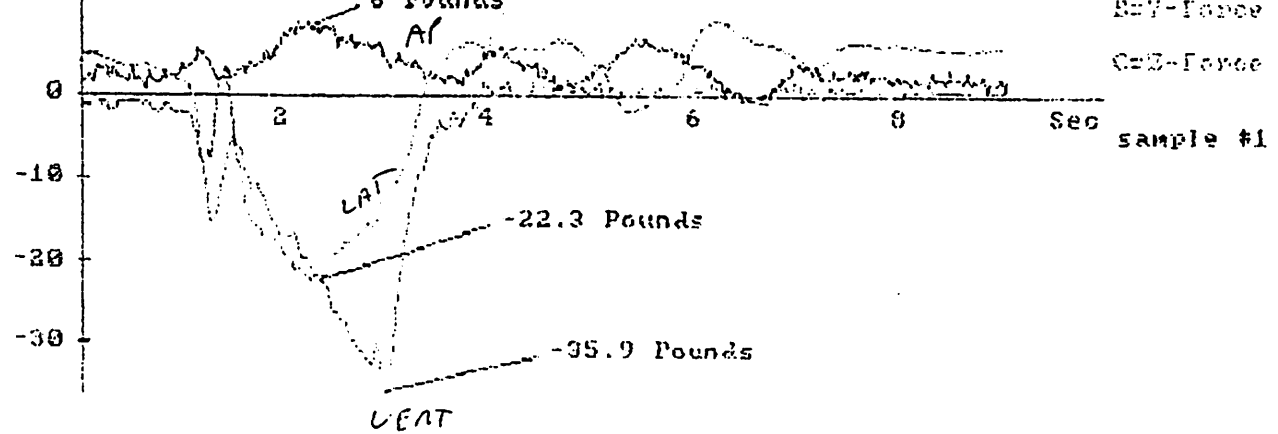
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C=Z-Force



Pounds

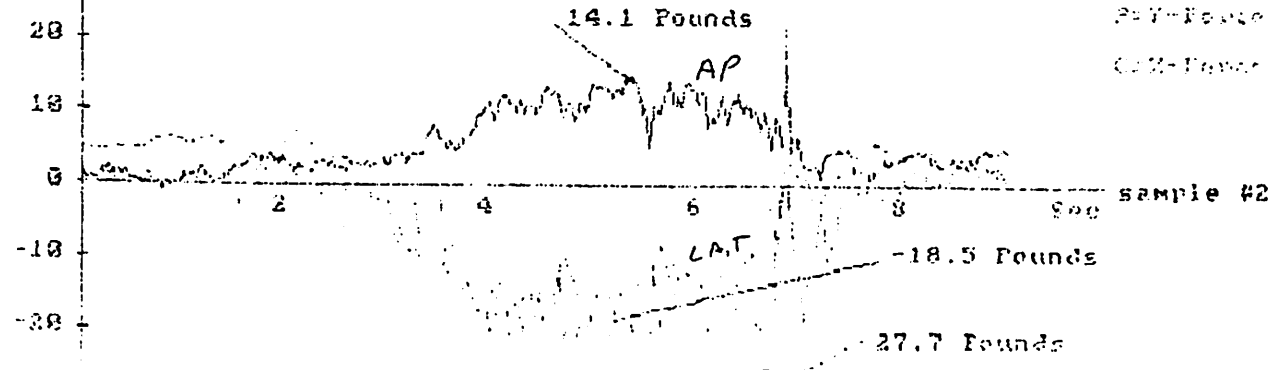
CBA Analog Module
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A=X-Force
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C=Z-Force



Pounds

A=X-Force
B=Y-Force
C=Z-Force

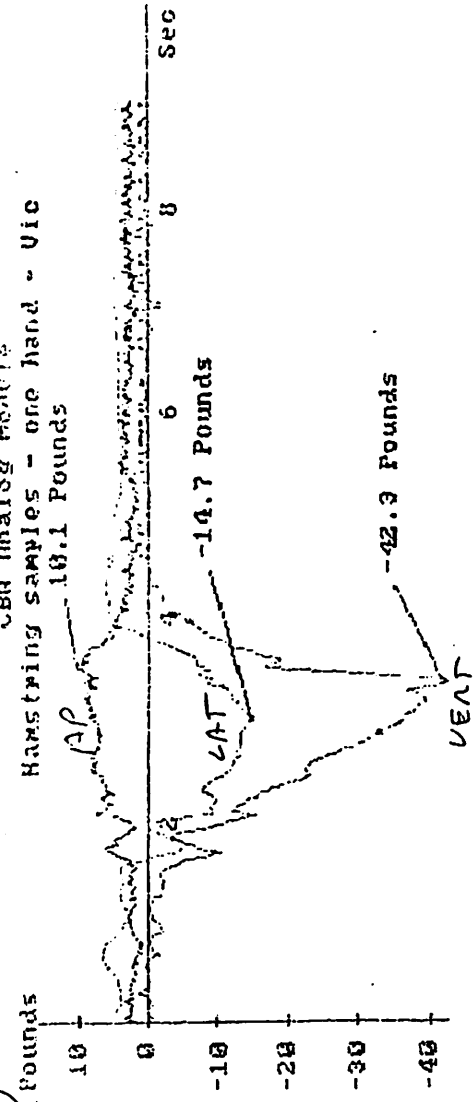


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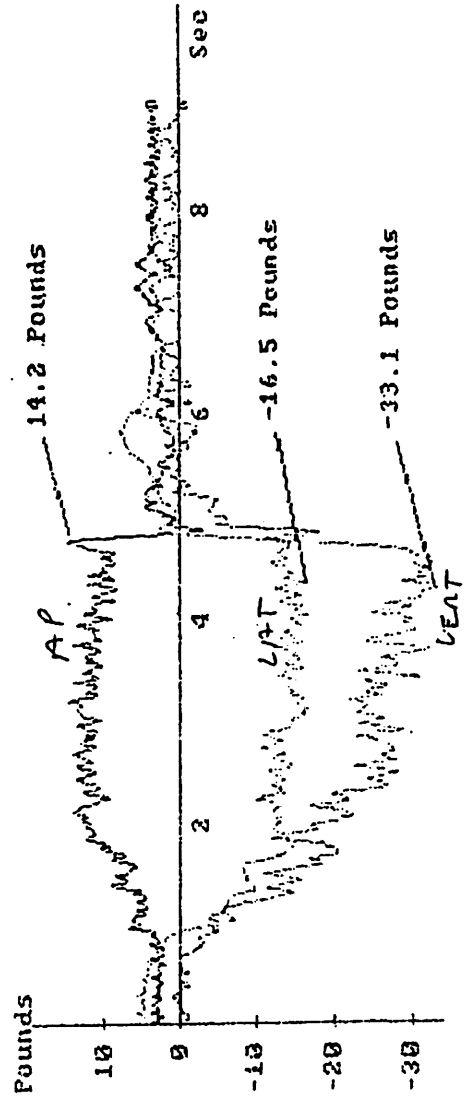
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CBR Analog Module
Hamstring samples - one hand - Vic
18.1 Pounds



A=X-Force
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C=Z-Force

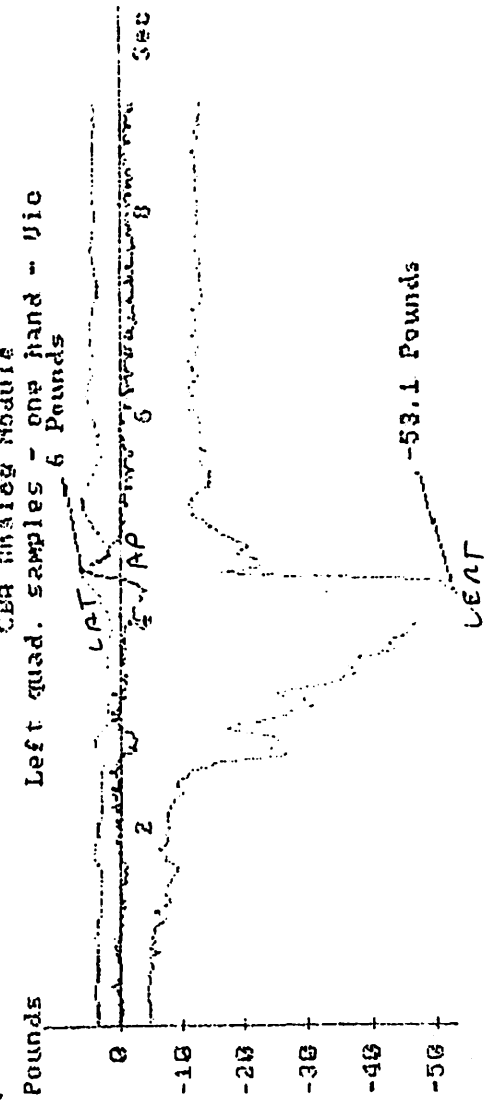
sample #4



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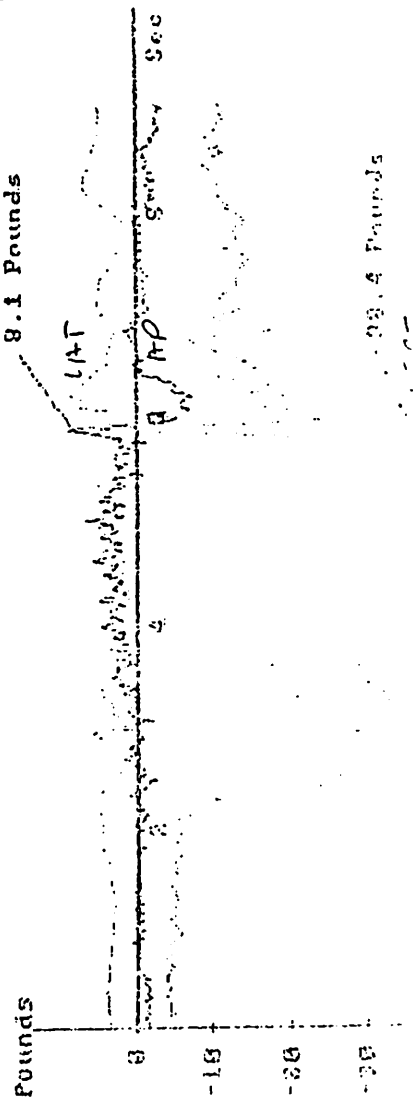
sample #1

CBR Analog Module
Left quad. samples - one hand - Vic
6 Pounds



A=X-Force
B=Y-Force
C=Z-Force

sample #2



-33.4 Pounds

IDENTIFYING THE NEED FOR B VITAMINS, MANGANESE, AND COENZYME Q:
AN ANSWER TO RECURRENT HYPOGLYCEMIA AND HYPOADRENIA

Walter H. Schmitt, Jr., D.C.

Abstract: Rebreathing increases CO₂ levels. CO₂ is produced by the citric acid cycle (CAC). When rebreathing results in weak muscles becoming strong, it implies a need for one or more of the nutrients which are necessary for CAC activity, particularly thiamine, riboflavin, niacinamide, pantothenic acid, lipoic acid, and/or manganese. The possible relationship between lipoic acid and mercury toxicity is considered. The relationships between the major energy production pathways in the body, glycolysis, CAC, and electron transport chain (ETC), are discussed with emphasis on the role of coenzyme Q in the ETC. The importance of correcting these faults is discussed in relationship to reducing hypoglycemic and hypoadrenic patterns.

INTRODUCTION

Whenever there is a chemical imbalance which affects cells throughout the entire body, we assume that there is a coincident muscle imbalance which reflects this chemical imbalance. This assumption has led to many clinical findings which make up the bulk of this author's seminars entitled "The Links Between the Nervous System and the Body Chemistry". In chemical imbalances which affect the entire system, we have observed muscle imbalance patterns which usually affect all muscles which are weak in the clear (gamma 2 weaknesses).¹

In an effort to understand the clinical significance of some of the fundamentals of intermediary metabolism, we attempted to identify applied kinesiological indicators of imbalances in the citric acid cycle (CAC), the electron transport chain (ETC), the urea cycle, and other pathways. The neuromuscular expressions of imbalances in the CAC pathways and the ETC which can be tested

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via muscle testing has been established and is the object of this paper.

Energy is produced through several classical metabolic pathways. See Figure 1. When these pathways are blocked, the body cannot derive its full complement of energy from the combustion of glucose, fats, or amino acids. This results in a rapid burning of glucose by glycolysis to produce what little energy this pathway yields. Subsequently, hypoglycemia develops which induces chronic stress to the adrenal glands to produce glucocorticoids for the mobilization of glucose stores to keep up with the increased demand for blood glucose. In time, hypoadrenia develops.

If we can identify the blockages in these metabolic pathways and correct them structurally and/or chemically, then we can improve the patient's energy, take the stress off the blood sugar metabolism, and remove the demands from the organs associated with maintaining the blood glucose level. These corrections allow the adrenals, liver, and pancreas to return to a normal level of function. This has proven most effective in treating chronic blood sugar and adrenal problem patients.

CITRIC ACID CYCLE

The citric acid cycle (referred to in this paper as CAC and also known as the Krebs' cycle or the tricarboxylic acid cycle) is a fundamental part of the intermediary metabolism. It is an important step in the production of energy and is the destiny of a number of important metabolites which are derived from

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the metabolism of carbohydrate, fat, and protein.

FIGURE 1

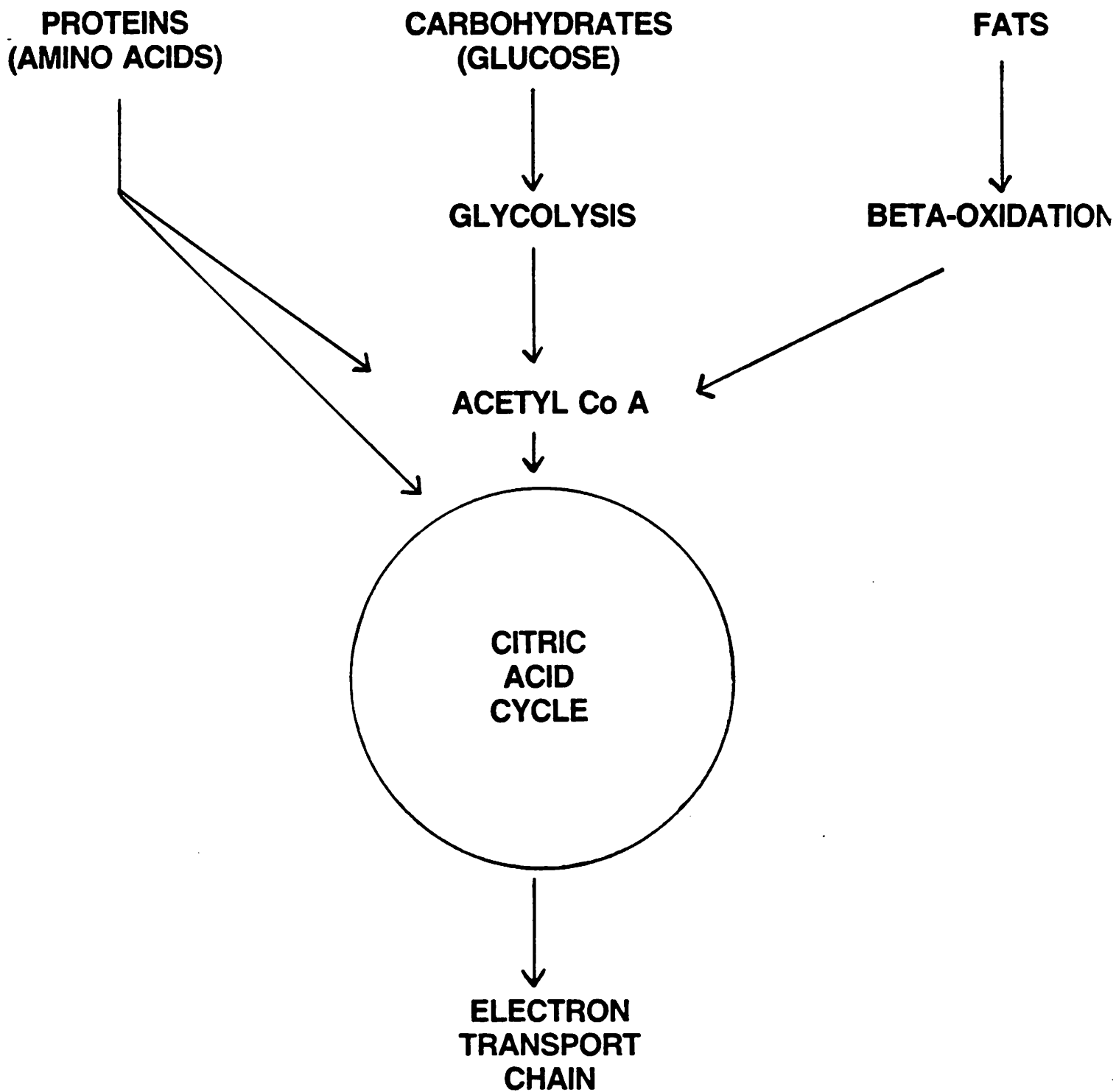


Figure 2 shows the citric acid cycle and the vitamin and mineral cofactors which are necessary at each step of the cycle. Various nutrients are necessary to make the citric acid cycle function, and these are : thiamine (B-1), riboflavin (B-2), niacinamide (B-3), pantothenic acid (B-5), manganese, phosphorus (for ATP), lipoic acid, iron, sulfur, biotin, and magnesium. Of these, the ones we find most important clinically are summarized in Figure 3.

Figure 2
CITRIC ACID CYCLE

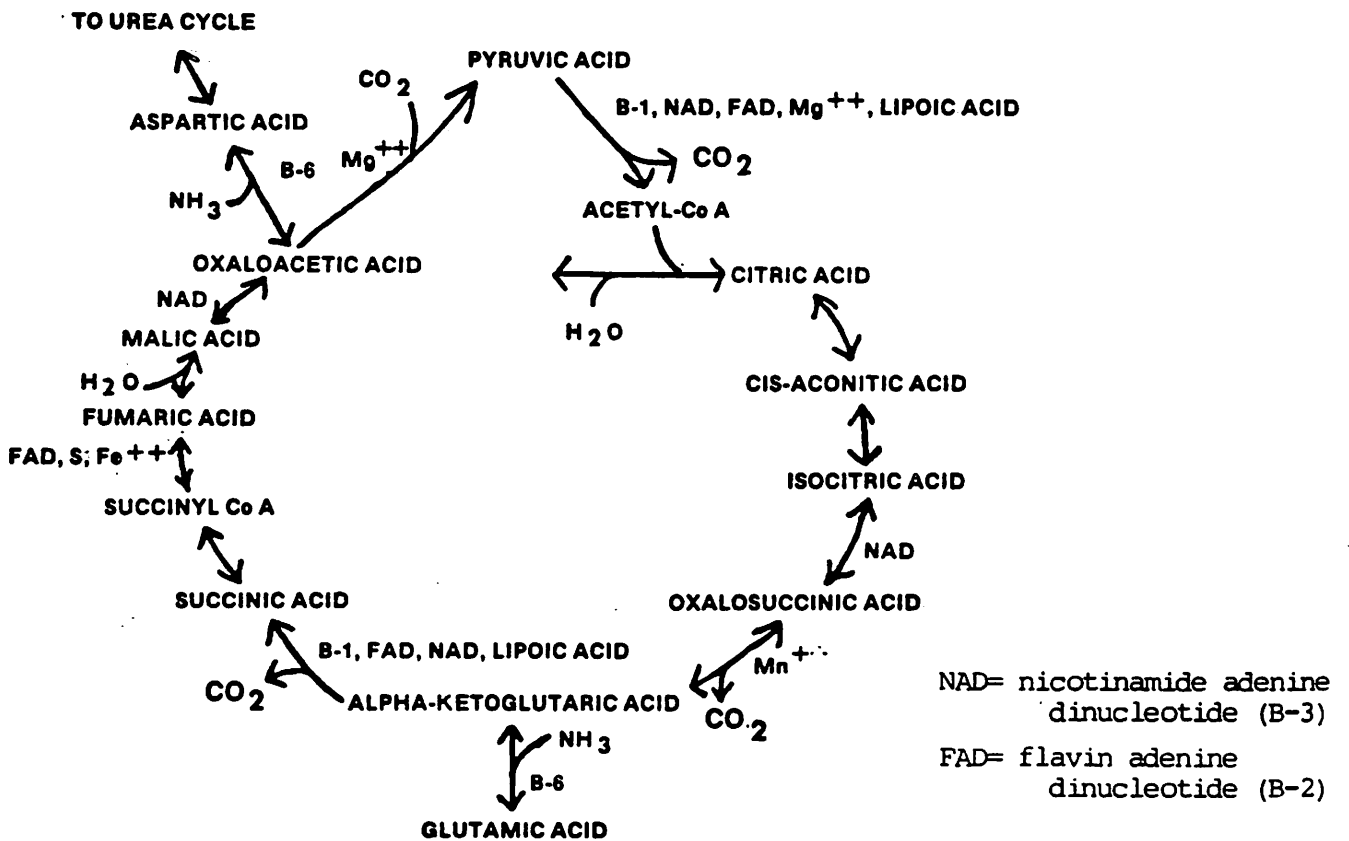
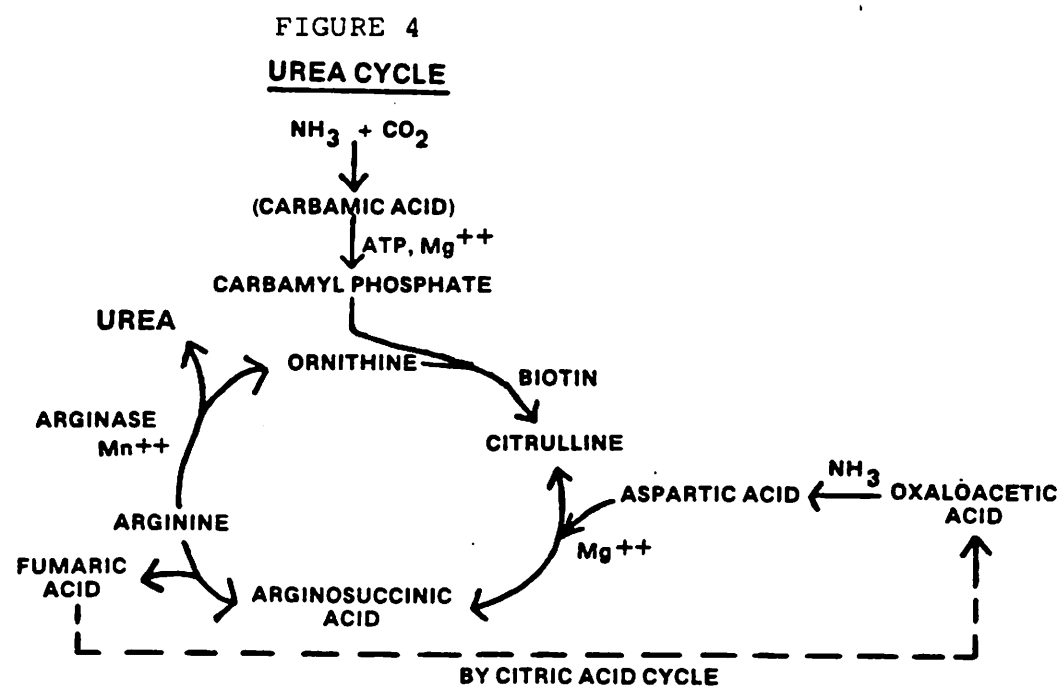


FIGURE 3
MOST IMPORTANT CITRIC ACID CYCLE FACTORS

- THIAMINE (B-1)
- RIBOFLAVIN (B-2)
- NIACINAMIDE (B-3)
- PANTOTHENIC ACID (B-5)
- LIPOIC ACID
- MANGANESE

In Figure 2 note how many times carbon dioxide (CO₂) appears. This is our first clue in how to understand when there is a potential problem with the CAC. CO₂ is usually thought of as a waste product in the body, but it is also a very essential molecule. As you know, our respiration is increased, not in response to lowered oxygen tension in the blood, but to elevated CO₂ levels. Likewise, as can be seen in Figure 4, CO₂ is the essential substance necessary to combine with ammonia to initiate the urea cycle.



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There are 4 CO₂ molecules released at various points in Figure 2. Since CO₂ is an essential substance, we have our patients perform rebreathing in a paper bag to increase CO₂ levels and observe the response in muscle testing. In many patients we observe weak muscles strengthen upon rebreathing six or seven breaths in a paper lunch bag sealed around the nose and mouth.

Upon further testing, the weak muscles also strengthen upon oral insalivation of one or more of the substances listed in Figure 3. When the appropriate nutrient(s) are supplemented at moderate levels (four to ten times the RDA), there is no recurrence of the muscle weakness pattern and rebreathing rarely strengthens the patient on subsequent treatments.

Patients symptoms, particularly those associated with low energy, fatiguability, hypoglycemia, low adrenal function, and ammonia excess improve. Note in Figure 4 that oxaloacetic acid from the CAC becomes aspartic acid and enters the urea cycle on the right. Fumaric acid leaves the urea cycle on the left and returns to the CAC. In other words, the removal of ammonia from the body by the urea cycle is dependent on proper CAC function for the production of both CO₂ and oxaloacetic acid. The urea cycle and CAC are interconnected like two gears by these metabolites, a very efficient system of recycling by the body.

It was soon learned that there was an alternative to the rebreathing procedure which could be used to further understand problems occurring in the CAC. It is possible to obtain pure

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citric acid as well as alpha-ketoglutaric acid (a-kg), two of the important metabolites of the CAC. A muscle strengthening response to CO₂ from rebreathing in a paper bag is nearly always accompanied by a parallel strengthening response upon oral insalivation of a-kg, citric acid, or both. This tells us that the patient needs more a-kg, and/or citric acid or both and is a good indication that the CAC is not running at the proper level for that patient.

When a-kg strengthens, sometimes citric acid strengthens and sometimes it weakens a strong muscle, and sometimes there is no response. We occasionally observe a weakening response from a-kg as well. By comparing the strengthening and weakening patterns of a-kg and citric acid, it is easy to "pick apart" the CAC and identify a block in the metabolic pathways shown on Figure 2. Application of the appropriate nutrient removes the block and the patient's symptoms improve since a major source of muscle weakness has been corrected.

One might think that the best therapy in these patients is to supplement with a multiple B vitamin or with a multiple vitamin-mineral supplement. But this is usually not as effective as supplying the particular nutrient or nutrients which the patient needs. In fact, we see many patients who are already taking a supplement which contains adequate doses of multiple B vitamin factors and yet who still display a CAC problem.

We treat patients who have imbalances, and it is necessary to treat an imbalance with an imbalance. Multiple nutrients

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raise the level of all nutrients but leave the patient with the same imbalance, hence the necessity of identifying the appropriate nutrient and supplementing it individually.

Example 1: A weak muscle strengthens when a patient rebreathes his own air in a paper bag six times. The muscle also strengthens when he tastes a-kg. But strong muscles get weak upon tasting citric acid. This implies that there is a buildup of citric acid and a deficiency of a-kg production. By looking at Figure 2, you can readily observe that there is a block between citric acid and a-kg. The two nutrients which are found between citric acid and a-kg are niacinamide (NAD) and manganese (Mn^{++}). One or both of these nutrients will also strengthen a weak muscle and should be supplemented.

Example 2: A weak muscle strengthens on rebreathing. Citric acid and a-kg both strengthen also. The patient requires both substances which implies that the entire cycle is not operating properly. All of the nutrients in Figure 3 are tested. A need for any one or several of these nutrients will be indicated by a strengthening response in the weak muscle. The appropriate one(s) should be supplemented.

LIPOIC ACID AND MERCURY TOXICITY

It is may be noted that lipoic acid is normally synthesized by the body in ample quantities. However, in some of our most difficult patients, we have had striking improvements upon supplementation of this substance. Lipoic acid is known to be inactivated by mercury and arsenic², and it is possible that many

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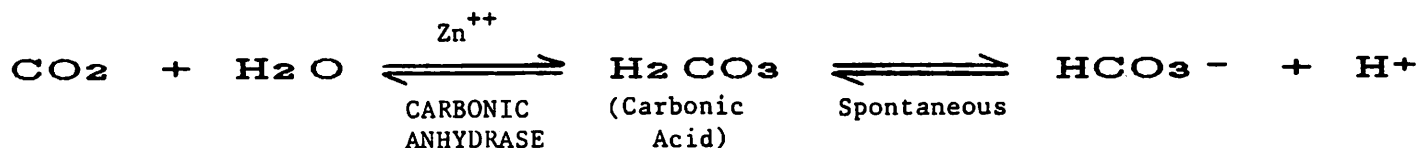
of the low energy patterns and other symptoms associated with the controversial mercury toxicity syndrome may be due to the inactivation of lipoic acid and thereby the short-circuiting of the CAC. We frequently find a need for lipoic acid in patients who have chronic symptoms and a mouth full of mercury-containing silver amalgams. Some of these patients have documented mercury toxicity and others do not. But many patients respond favorably to the addition of lipoic acid to their programs.

CRANIAL TECHNIQUE WITH CO₂ AND THE CAC

Recent research by Dr. Goodheart involves the correction of cranial faults with simultaneous rebreathing to affect the oxygen - CO₂ set point in the brain.³ A need for this dramatic technique can be screened for by a combination of pre-test imaging which is used in screening to detect a cranial fault⁴ and rebreathing creating a strengthening of a weak muscle. It must be noted that, occasionally, rebreathing to increase CO₂ levels will result in a weakening of strong muscles. This, too, can be an indication for cranial correction coincident with rebreathing.

Goodheart has noted a relationship between recurrent cranial faults and a need for zinc.⁵ He attributes this connection to the fact that cerebrospinal fluid (CSF) is produced under the influence of the zinc dependent enzyme, carbonic anhydrase. Carbonic acid is formed by combining water with CO₂ in the presence of carbonic anhydrase as shown in Figure 5. The CO₂ for this reaction comes from the CAC. Goodheart's observation that zinc is necessary for the production of CSF is based on the

FIGURE 5



assumption that there is adequate CO₂ available to initiate this reaction in the first place. As previously discussed, this is often not the case.

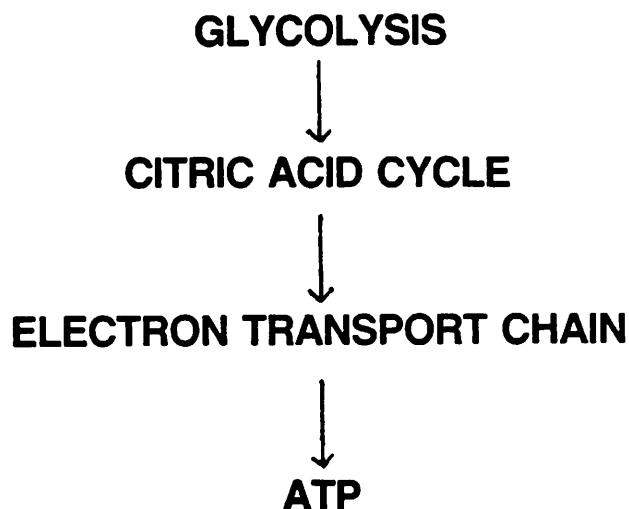
Correction of cranial faults with rebreathing has resulted in excellent clinical responses in our patients, but a number of patients show recurrence of the pattern. When such a patient strengthens on rebreathing on subsequent visits, it suggests a need for one or more of the nutrients in Figure 3. If a patient shows positive pre-test imaging or other indication of a cranial fault, and if none of the CAC nutrients test positive and/or rebreathing to increase CO₂ is negative, then this is a good indication that the patient requires zinc as described by Goodheart. Oftentimes patients show a need for zinc and CAC nutrient(s).

THE ELECTRON TRANSPORT CHAIN AND COENZYME Q₁₀

Figure 1 portrays the three major steps in the production of energy (i.e., ATP) from proteins, carbohydrates, and fats. Figure 6 summarizes these steps in relationship to the production of energy from glucose. Metabolism of one molecule of glucose through glycolysis produces only two high energy ATP bonds and

FIGURE 6

3 STEPS IN PRODUCTION OF ENERGY FROM GLUCOSE



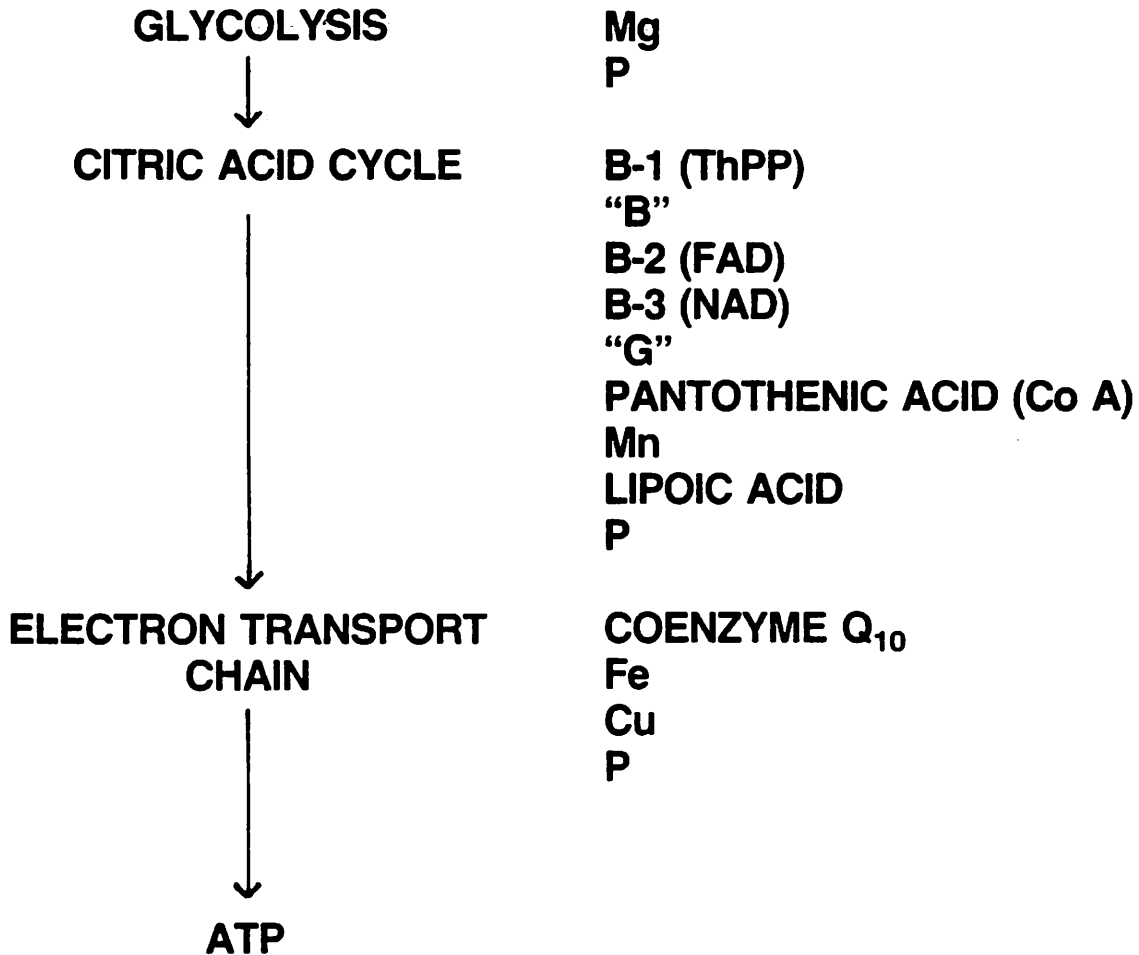
results in two molecules of pyruvate. Three more molecules of ATP are produced from the conversion of pyruvate to acetyl coenzyme A. Twelve more ATPs are formed by the citric acid cycle.

The actual production of these high energy ATP bonds is via the ETC. The ETC receives $\text{NADH} + \text{H}^+$ and FADH_2 from the metabolism of carbohydrate, fat, and amino acids by the above pathways and converts it via iron and copper containing cytochromes to ATP molecules. But the molecule which opens the door to the ETC, the usher which allows entry of the $\text{NADH} + \text{H}^+$ and FADH_2 into the ETC, is coenzyme Q₁₀ (CoQ₁₀). CoQ₁₀ is the name given the chemical substance, ubiquinone. The nutrients most commonly found necessary at each step along the way in the

production of ATP from glucose are summarized in Figure 7.

FIGURE 7

NUTRIENTS FOR OXIDATION OF GLUCOSE



CoQ₁₀ is an essential substance for the production of energy in the body. Glycolysis and the other energy producing pathways for carbohydrate, fat, and protein inevitably result in the production of NADH + H⁺ and FADH₂ and these molecules must enter and go through the ETC for the actual production of energy. This takes place in just about every cell in the body. So without

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CoQ₁₀, we simply cannot produce energy.

It would be like having a car with an empty gas tank sitting at a gas pump, but the cap to the gas tank is locked and no one can find the key. CoQ₁₀ is the key to the gas tank cap for our body's energy production. Once the cap is off, the gas can be pumped into the tank and the engine can produce energy. Once the CoQ₁₀ is present, the production of NADH + H⁺ and FADH₂ by the above pathways can finally result in the production of energy (ATP) for cellular function, of any cell. This is why CoQ₁₀ has received such a great reputation for affecting so many different symptoms in so many different areas of the body.

Goodheart⁶ has identified the need for CoQ₁₀ in patients with small intestine involvement through his "neuropeptidal enteric hologramic technique". Our observations have paralleled Goodheart's in that we have found a response to CoQ₁₀ in many patients who demonstrate small intestine involvement by a gamma 2 muscle weakness strengthening on therapy localization (TL) to acupuncture point small intestine-19 (SI-19). This is always accompanied by a positive TL to the small intestine neurolymphatic reflexes (NLs) for the quadriceps and the abdominals. It is very important to treat these NLs in addition to supplementing with the CoQ₁₀.

The metabolism has unfolded right before our eyes in a number of cases who initially responded to rebreathing, cranial correction with rebreathing, and supplementation with one of the CAC nutrients in Figure 3. Subsequent to these corrections, on

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either the same day, or the next office visit, we have seen some of these patients demonstrate a positive TL to SI-19 which was not previously present. The TL to SI-19 was neutralized by insalivation of CoQ₁₀ as was TL to the small intestine NLs which were also present.

In some of these patients, the response to the initial treatment was excellent, only to have the patient have a recurrence and exacerbation of his or her symptoms two or three days after the first treatment. On follow up, these patients were found to show TL to SI-19 and the small intestine NLs. This TL was neutralized by insalivation of CoQ₁₀. Treating the small intestine NLs and supplementing with CoQ₁₀ achieved the previous excellent improvement in the patient's condition which was maintained this time.

Example 3: A woman with failed disc surgery and left sciatica was making slow progress under standard AK care. On a particular visit, she was found to strengthen on rebreathing and show a positive pre-test imaging which was indicative of a cranial fault. Of the CAC factors tested, she responded only to pantothenic acid. The cranial fault was corrected while she simultaneously rebreathed in a paper bag. She was placed on a pantothenic acid supplement.

For the following three days she was pain free and felt the best she had in many months. On the fourth day, her pain and disability returned with a vengeance and she was much worse than prior to the previous treatment. On her next office visit,

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rebreathing was negative, pre-test imaging was negative, hence there were no cranial faults present but the patient had acute sciatica and a straight leg raise (SLR) limited to about 45 degrees. She showed a positive TL to SI-19 which was neutralized by insalivation of CoQ10. The chewing of CoQ10 improved her SLR to 75 degrees. Treatment of the small intestine NLs resulted in a return of the SLR to 90 degrees and an elimination of her pain.

Although this seems dramatic, it is a common occurrence when using muscle testing to pick apart the metabolism. We have seen a number of response patterns identical to this one, but with many different symptom pictures, from low energy to digestive disturbances to sinus problems to endocrine symptoms to musculoskeletal symptoms anywhere in the body. When you affect the basic metabolism of the body, you affect any cells in the body that are not functioning properly.

When there is a lack of CoQ10, there is an inability for cells to produce energy by the ETC. But supplying CoQ10 while be to no avail if the patient has a blockage somewhere higher up in the metabolic pathways such as in the CAC. Likewise, supplementing CAC nutrients alone, and ignoring the associated cranial fault(s) will change the chemistry, but will not affect a change in the neurological interference which is associated with the chemical imbalance. It is necessary to address the patient structurally, chemically, and mentally as there are truly links between the nervous system and the body chemistry.

CONCLUSIONS

Rebreathing increases CO₂ levels which strengthens many patients. When rebreathing strengthens, it implies that the body needs more CO₂. Since the CAC is a major source of CO₂, a strengthening response on rebreathing usually denotes a need for one or more of the nutrients which are necessary for CAC activity. This can be further confirmed by testing patients with citric acid and a-kg, two of the intermediary substances of the CAC.

Properly functioning glycolysis, CAC, and other metabolic pathways, are dependent on the ETC for the actual production of high energy ATP bonds. Molecules such as NADH + H⁺ and FADH₂ from glycolysis and the CAC and other pathways require CoQ₁₀ to open the door into the ETC so their potential energy may be realized. TL to SI-19 is one indicator that CoQ₁₀ is needed by the patient, especially if TL to this point occurs following cranial correction with rebreathing and/or recurs following supplementation with CAC nutrients.

Correcting fundamental metabolic pathways such as these results in a normal production of energy from the metabolism of our dietary calories. Failure of the CAC results in the body attempting to produce all of its energy via glycolysis since there is a block beyond glycolysis. The result is a rapid, inefficient, and incomplete burning of glucose and a build up of pyruvate, hence low energy symptoms, and a tendency toward hypoglycemia. To maintain adequate blood glucose levels for this

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rapid glucose burning, the body places excess stress on the adrenal glands for glucocorticoid production and/or the pancreas for glucagon production. The liver and muscle glycogen stores tend to become depleted and any number of subsequent problems may develop. The patient craves sugar and is driven to eat refined carbohydrates which does nothing to replenish the nutrients which are depleted.

Pyruvate, which cannot be metabolized to enter the CAC, may be converted to lactic acid and result in even greater fatigue. This puts a great stress in the adrenal glands for two reasons: 1) they must constantly be attempting to mobilize glucose in order for the body to produce at least a little energy through glycolysis, and 2) the subsequent buildup of lactic acid is also a strong adrenal stimulant and hence, very stressful to these glands. The result is chronic low blood sugar and chronic adrenal gland stress.

Using the methods described herein based on muscle testing and standard biochemistry, we can visualize our patients' problems, more rapidly penetrate them, and relieve our patients' suffering in a most acceptable fashion. In this manner, we can use muscle testing to "pick apart" the body's metabolism furthering the concept that there are definite "links between the nervous system and the body chemistry".

SUMMARY OF PROCEDURES

**IF REBREATHING STRENGTHENS, CHECK:
 CITRIC ACID CYCLE FACTORS**

**B-1
 "B" (S.P.L.)
 MANGANESE
 PANTOTHENIC ACID
 B-2
 NIACINAMIDE
 "G" (S.P.L., E.P.)
 LIPOIC ACID**

**CORRECT CRANIAL FAULTS WITH REBREATHING
 SUPPLEMENT APPROPRIATE NUTRIENTS**

IF SI-19 TLs, CHECK:

**CoQ10
 SI NLS**

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MAKING B-6 WORK

Activating Pyridoxine to Pyridoxal-5-Phosphate

Walter H. Schmitt, Jr., D.C.

Abstract: B-6 functions in the body in an activated form as pyridoxal-5-phosphate (P-5-P). Activation of B-6 to P-5-P requires two chemical steps which depend on four nutrients: magnesium, zinc, riboflavin, and phosphorus. A need for any of these four nutrients can interfere with the effectiveness of B-6 by interfering with its activation. The effect of P-5-P on the metabolism of ammonia is discussed.

Vitamin B-6 has been a controversial nutrient during the past few years. Although the recommended daily allowance (RDA) for B-6 is only 2 mg., doses of hundreds or even thousands of times this amount have been regularly taken by patients at either their own discretion or on the recommendation of their doctors. The controversy has arisen from reports of cases of B-6 toxicity which resulted in reversible neurological changes. There were only a handful of these cases ever reported and these few resulted from daily doses of B-6 in the 2000 mg. and up range. However, these reports have scared many patients out of taking as little as 50 mg. of B-6 per day. This paper hopes to put this matter into perspective for both the practitioner and the patient as well by giving tools for identifying the need for B-6.

INDICATIONS OF A B-6 NEED

There are numerous symptoms associated with a need for B-6 in its coenzyme form. Depression, water retention, carpal tunnel syndrome, kidney stones (calcium oxalate), seizures, menstrual and premenstrual problems, anemia, and many, many other problems have been associated with a need for B-6.

One of the major functions of B-6 in the body is in the

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processing of ammonia molecules (transamination, amination, deamination, and in the generation of the urea cycle). These functions may be assessed by having a patient sniff a source of plain (not scented) ammonia.

If a strong muscle weakens or a weak muscle strengthens when a patient sniffs ammonia, it implies that the patient is not moving ammonia around properly. Since all the transaminase enzymes (including SGOT, and SGPT) which move ammonia around the body are dependent on B-6, a lack of this nutrient in its activated form will result in the inability of the patient to detoxify ammonia. Also B-6 is essential in the first step of the urea cycle which is the means by which our bodies rid themselves of ammonia waste and water.

Many symptoms can result when these elimination pathways are not working including mental sluggishness, water retention, premenstrual syndrome, intervertebral disc swelling, and other musculoskeletal inflammations to name just a few. When sniffing ammonia weakens a strong muscle (more common) or strengthens a weak muscle (less common), the most common reason is a need for more B-6. B-6 placed in the mouth will often neutralize the weakness induced by sniffing ammonia or strengthen the muscle which ammonia strengthened. This is an excellent way to identify the need for B-6.

Most every neurotransmitter depends on B-6 somewhere along the line in its production. Therefore any mental symptoms, such as depression or anxiety, and any neurological symptoms such as

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paresthesias, tremors, or seizures, are likely related in part to a need for B-6. B-6 is important in so many other metabolic pathways that we have found the indication for its need goes far beyond the original applied kinesiology indicator of a weak anterior scalene muscle. In fact, when there is a need for B-6 in the body, the effects are usually so far-reaching that any weak muscle will respond by strengthening when B-6 is insalivated.

Any patient taking oral contraceptives will require extra B-6 (and also folic acid) supplementation. Many women's symptoms which develop while they are taking oral contraceptives are a direct result of the need for more B-6 (and/or folic acid) which is created by taking the pill. The effects of B-6 on maintaining proper hormone balance are the basis for its need in many endocrine problems.

ACTIVATION OF B-6

Vitamin B-6 is generally defined as pyridoxine. But B-6 exists in nature in a number of forms such as pyridoxal and pyridoxamine. For any of these B-6 substances to be of any use in the body, it must be converted to the active, coenzyme form of B-6, that is, pyridoxal-5-phosphate (P-5-P). To convert pyridoxine to its active P-5-P form, it must be both phosphorylated and oxidized. These reactions can occur in either order, but they both must take place for B-6 to do us any good in our bodies.

Figure 1 demonstrates one of the pathways for the formation

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B-2. These four nutrients which are necessary for the activation of B-6 are summarized in Figure 2. If any one or more of these four nutrients are in short supply, it may interfere with the activation of B-6 to P-5-P. Patients who have such a nutritional shortage can take massive amounts of B-6 with little or no benefit since the B-6 is unable to be activated to its useful form, P-5-P.

FIGURE 2
NUTRIENT FACTORS WHICH ACTIVATE B-6 TO P-5-P

MAGNESIUM
ZINC
RIBOFLAVIN
PHOSPHORUS

Some patients may have a genetic inefficiency at producing P-5-P from B-6. These patients may be benefitted by taking large doses of B-6 or by taking B-6 in its already activated P-5-P form. However, in the average practice, these patients are few and far between. More commonly, we encounter patients who are deficient in zinc, riboflavin, magnesium, and/or phosphorus.

Using standard muscle testing, it is easy to identify the patient who is short on one or more of the B-6 activating substances and therefore appears as if he or she needs B-6. If a patient is taking B-6, or if a patient shows an obvious clinical need for B-6 (such as weakening or strengthening on sniffing ammonia), yet weak muscles do not respond to B-6 when it is insalivated, then this patient should be tested with P-5-P. If P-5-P strengthens a weak muscle when B-6 does not, this is a sure

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indication that the patient is not activating B-6 to its P-5-P form.

Test the patient's weak muscle(s) against oral insalivation of each of these nutrients. This patient should be supplemented with zinc, riboflavin, magnesium, and/or phosphorus as indicated by the results of muscle testing findings. In difficult patients or rarely encountered genetic problems, supplement with the P-5-P form of B-6 itself. Supplement those nutrients which create strengthening of the weak muscle using a dose of four to ten times the RDA and be sure that the patient tastes the supplements each time they are taken. Within a week or two, neither the B-6 nor the P-5-P should strengthen the patient.

If on follow up, B-6 strengthens, it implies that now, since the patient is activating B-6, the body is in need of more B-6 itself, whereas before, the B-6 may have been low, but the body did not care because it could not activate it anyway. We usually find that an initial dose of 50 mg. of B-6 three times a day can eventually be decreased to 50 mg. once a day if the B-6 is being properly activated to P-5-P.

If B-6 does not strengthen on follow up, but P-5-P still strengthens, recheck each of the four nutrients in Figure 2. You will usually find a need for still another of these nutrients or possibly a slightly larger dose of the previously supplemented nutrient(s).

Example 1: A woman with low back pain, water retention, and depression has been taking oral contraceptives for a year. Six

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months after starting the pill, she developed her symptoms. A weak muscle is identified and it responds to B-6. The patient also shows a generalized weakening of all her muscles when she sniffs ammonia and this is neutralized by the insalivation of B-6. The patient is placed on 50 mg. of B-6 three times a day for a total daily dose of 150 mg.

On the next visit, there is little improvement in any of her symptoms. Ammonia still causes general weakness when sniffed. B-6 does not strengthen any of her muscles nor does it neutralize the weakness induced by sniffing ammonia as it had originally. P-5-P is placed in the mouth and this causes both a strengthening of her weak muscle and neutralizes the weakness induced by sniffing ammonia. She is subsequently tested for magnesium, zinc, riboflavin, and phosphorus by placing each of these in turn in the mouth and testing the weak muscle.

Riboflavin and magnesium are found to strengthen the weak indicator muscle. Testing against the sniffing of ammonia with each of these nutrients in the mouth shows that each one also neutralizes the ammonia induced weakness also. The patient is placed on riboflavin and magnesium supplementation and on the next office visit, she is improved in all of her symptoms. She shows no strengthening on B-6 nor P-5-P and there is no weakness induced by sniffing ammonia. In time, she may reduce her B-6 intake to one 50 mg. pill a day, as long as she continues to take the riboflavin and magnesium which are necessary for its activation to P-5-P.

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Example 2: A fifty year old man has a mild, but chronic L-5 / S-1 disc protrusion. He responds to muscle balancing and gentle manipulation temporarily, but the swelling in the disc will not diminish. The patient also has a recurrent psoas muscle weakness. The patient shows generalized weakening of muscles when sniffing ammonia. The psoas does not respond to B-6, but does strengthen when he tastes P-5-P. Insalivation of P-5-P also neutralizes the weaknesses induced by sniffing ammonia. The weak psoas is tested against the insalivation of magnesium, zinc, riboflavin, and phosphorus. It strengthens with zinc and riboflavin. The weakening effects of ammonia sniffing are also negated while either zinc or riboflavin are held in the mouth. The patient is supplemented with 15 mg. of zinc twice a day and 25 mg. of riboflavin once a day. In a week, the swelling in the disc has diminished and the patient begins to make continued progress.

This patient had adequate levels of B-6 in his body, but was responding poorly because of an inability of his body to activate B-6 to P-5-P. Because of this low P-5-P level, he could not eliminate ammonia waste and therefore he could not adequately eliminate water through the urea cycle. The retention of water in this patient became evident at the weakest link in his physiology, that is the area of the disc injury, hence the continued swelling of the disc. Improving P-5-P function by supplementing magnesium and riboflavin also improved his kidney function for the elimination of urea and water and hence the

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additional benefit of a strong psoas to aid in the balancing of the lumbar spine.

CONCLUSIONS

B-6 is an essential nutrient which plays important roles in many of the body's metabolic pathways including the processing and removal of ammonia. Having patients sniff ammonia often results in a generalized weakening of muscles or an occasional strengthening of weak muscles. The most common factor associated with a response (weakening or strengthening) to sniffing ammonia is a need for more P-5-P.

It is fairly common to find patients who are taking B-6 in doses far greater than the RDA of 2 mg per day. It is also common to encounter patients who show a need for B-6, especially women taking oral contraceptives, patients with water retention or inflammation, and patients with mental and neurological problems. For B-6 to be effective, it must be converted to its P-5-P form. The failure of B-6 to improve patients with an obvious need for B-6 (such as weakening or strengthening on ammonia sniffing) is usually due to the body's inability to convert B-6 to P-5-P. Although this may be genetic, it is usually due to a need for one of the nutrients which are necessary for the phosphorylation and oxidation of B-6 to P-5-P, namely magnesium, zinc, riboflavin, and/or phosphorus.

SUMMARY OF PROCEDURES FOR ACTIVATING B-6 TO P-5-P

1. If patient does not strengthen on B-6, yet shows signs or symptoms of a need for B-6, test P-5-P.

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2. If P-5-P strengthens and B-6 does not, test individually: magnesium, zinc, riboflavin, and phosphorus. Supplement with the nutrient(s) which strengthens the weak muscle.
3. On the next office visit, recheck with B-6 and P-5-P.
 - a. If B-6 now strengthens, supplement with low doses of B-6.
 - b. If B-6 does not strengthen and P-5-P strengthens, recheck : magnesium, zinc, riboflavin, and phosphorus. Supplement with the nutrient(s) which strengthen the weak muscle.
4. Any patient who shows a strong muscle weaken or a weak muscle strengthen upon sniffing unscented ammonia should be checked for a need for B-6 and / or P-5-P.

THE EFFECTS OF GAIT AND TORQUE ON ENHANCING AND SUPPRESSING
IMMUNE SYSTEM FUNCTION

Psychoneuroimmunology and Applied Kinesiology

Walter H. Schmitt Jr., D.C.

Abstract: Right-footed and left-footed gait patterns and their associated pelvic-spinal CCW and CW torque patterns are related to increased and decreased immune system function. These connections are based on some of the basic principles of psychoneuroimmunology, specifically that norepinephrine increases cAMP activity which suppresses immunity and that serotonin increases cGMP activity which enhances immunity. Therefore, CCW (right-footed) torque patterns suppress the immune system and CW (left-footed) torque patterns enhance the immune system. Caffeine is discussed as a stimulator of both CCW torque and cAMP activity, hence an immune system suppressor.

INTRODUCTION

Recently discovered interconnections between the nervous system and the immune system have given rise to a newly emerging field known as "psychoneuroimmunology" (PNI). The investigations which are ongoing in this field are most promising and fascinating. Several pioneer findings are of interest to those using applied kinesiology because they are so compatible with the chiropractic philosophy which pervades AK, that is, that "too much or not enough nerve energy is disease."¹

In an article by psychoneuroimmunology pioneer, George Solomon, a number of important studies are reviewed.² In the Soviet Union experiments have shown direct interrelationships between immune system function and certain centers in the hypothalamus. The activity of animals' hypothalami was monitored by microelectrodes implanted in the enteromedial hypothalamic nuclei. The animals were given a standard immunizing antigen and

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the hypothalamic cells were shown to increase their activity significantly.²

Guinea pigs which had the anterior hypothalamic cells surgically destroyed showed decreased tuberculin reactions² Destruction of rabbits dorsal hypothalamus completely suppressed their primary antibody response, and electrical stimulation of the area increased antibody response.² These experiments and many others imply that the body's ability to mount a response to infection depends on a normally functioning nervous system (or at least a normally functioning hypothalamus.)

Changes in the nervous system affect the immune system and changes in the immune system affect the nervous system. White blood cells and nervous system cells also have other important features in common. Both types of cells, and only these two types of cells, have been shown to have the capacity for memory. That is, we know that the seat of our conscious memory is apparently in the nervous system, and likewise, the immune system is the seat of our memory of whether or not something is friend or foe, whether we have previously had an infection or not (and thereby have immunity), and whether or not we react with something or against (as in allergy).

Further, receptors for neurotransmitters (NTs) are present in both nervous tissue as well as in cell membranes of white blood cells (particularly monocytes). And both nervous cells and white blood cells have receptors, and hence are sensitive to various hormones.³

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Selye discussed the "triad of chronic stress" which included, in addition to adrenal cortical enlargement and GI ulcer formation, the suppression of the thymus and the immune system.⁴ We have observed many adrenal depleted patients who also have thymus involvement and in whom, treatment directed at restoring normal thymus function is essential to their recovery.⁵

With all this being just the tip of the iceberg in the field of PNI, we can see that there will surely be forthcoming much more information which may be clinically useful. One area which has already been found to be valuable clinically is the interplay of various NTs on the immune system and the relationships of these NTs to patterns of muscle imbalance which can be identified using muscle testing as functional neurological evaluation.

NEUROTRANSMITTERS, SECOND MESSENGERS, AND IMMUNE FUNCTION

It has been shown that various NTs and hormones suppress immune system function. These include norepinephrine (NE) and other beta-adrenergics, as well as histamine, and prostaglandins.² Other NTs and hormones enhance immune system function. Among these are serotonin, acetylcholine, and insulin.²

NTs have their effects on immune system function as well as on nerves through the second messenger systems in cells. Second messengers are chemicals inside cells which are activated by stimuli such as NTs and hormones which affect cell membranes. They carry out the intended message by further activating

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enzymatic changes in the cytoplasm. The most well known second messenger system involves the activation and inactivation of cyclic adenosine monophosphate (cAMP) inside cells. This process involves phosphorylation and dephosphorylation of cAMP which acts like a chemical on-off switch for various enzymes (and other functions) in the cytoplasm. NE characteristically works via the second messenger cAMP. (Histamine and prostaglandins also activate the second messenger cAMP.)

An equally important second messenger is cyclic guanosine monophosphate (cGMP). Serotonin activates cGMP similarly to NE activating cAMP. (Acetylcholine and insulin also operate by activating cGMP.) In fact, cAMP and cGMP work in direct antagonism to each other on many metabolic activities, cAMP turning off what cGMP turns on and vice versa. And more importantly, different NTs activate different second messenger systems inside cells which is how two different substances such as NE and serotonin can have exactly opposite effects on the immune system.

NE activates cAMP inside cells, both in the immune system and in the nervous system. In a general sense, this activation of cAMP results in a suppression of the immune system.² Likewise, serotonin activates cAMP and this enhances immunity.² More will be said of the second messenger system later in this paper, but for now, we will concentrate on the facts that NE stimulates cAMP which results in suppressing the immune system and serotonin stimulates cGMP activity which results in enhancing

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immune system functions. (Although there are some exceptions to these general principles, the overall evidence to date suggests that these general patterns are accurate.)

GAIT TORQUE PATTERNS, INFRASPINATUS STRENGTH, AND THYMUS TL

In a series of papers, the most recent of which is entitled "Centering the Spine"⁶ this author has elaborated on the patterns of muscle weakness which are associated with various systemic chemical imbalances. Whenever there is a chemical imbalance in the body, there is a muscle imbalance which parallels it. In "Centering the Spine" the patterns of spinal torque associated with right foot forward gait and left foot forward gait patterns were discussed in relationship to the respective biochemical patterns which each might represent.

Some patients demonstrate patterns of gamma 2 muscle weakness which would be normal during a left foot forward gait pattern. When these muscles become strong when the supine patient is placed in a right foot forward gait pattern, this is associated with a need for more NE activity among other things.

Other patients demonstrate patterns of gamma 2 muscle weakness which would be normal during a right foot forward gait pattern. When these muscles strengthen when the supine patient is placed in a left foot forward gait pattern, this is an indication that the patient may require more serotonin activity among other things.

We have found many patients who appear to have immune system involvement and yet there is little or no apparent indication of

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this from our muscle testing. We know that the infraspinatus is associated with the thymus gland. Yet we see many patients who show a positive therapy localization (TL) to the thymus gland which strengthens multiple gamma 2 weak muscles, and yet there is no weakening of strong muscles when TLing the thymus. Neither do these patients show a weakness of either infraspinatus in the clear or when TLing the thymus or its reflexes. This seemed puzzling since the thymus gland is at the center of the immune system function, and it is involved with chronic stress patients who make up a large percentage of our practice.

In an interesting experiment to test the effects of stress on rats, the animals were placed on a phonographic turntable and spun round and round. This is very stressful to a rat, and it was shown that this spinning activity suppressed the rats' immune systems and interfered with their abilities to fight an infectious process.⁷

In an effort to apply this principle to human patients, and at the same time, possibly identify hidden immune system problems, we tried having patients spin around in a circle 4 or 5 times, and then tested the strengths of both right and left infraspinatus muscles. To our delight, we found many human patients are just as susceptible to the effects of spinning round and round as are rats. Spinning patients around (as if to make them dizzy) resulted in a weakening of many infraspinatus muscles, but to our surprise, it resulted in a strengthening of some patients' previously weak infraspinatus muscles.

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It did not take long to realize that, in those patients who had immune system involvement, spinning them in one direction resulted in a weakening of one or both infraspinati and a positive TL to the thymus. The thymus TL would both strengthen a weak muscle and weaken a strong muscle.

And spinning them in the opposite direction resulted in a strengthening of a weak infraspinatus and negated positive TL to the thymus. But at this early stage of investigation, there was no apparent pattern regarding which direction the patient would spin to bring out the immune system problem or to neutralize it.

Soon, we recognized that the differences between the group of patients who weakened when spinning in a counterclockwise (CCW) direction and the other group who showed weakening in a clockwise (CW) direction depended on whether the respective immune systems were overactive or underactive. Those who showed weakening on CCW spinning had overactivity of their immune systems which therefore needed suppressing. Those who showed weakening on CW spinning had underactivity of their immune systems which therefore needed enhancing to bring them to normal.

T-HELPER AND T-SUPPRESSOR LYMPHOCYTES

It had always been a curiosity to me why, when under chronic stress, one group of patients would show thymus and immune system involvement of the type which resulted in them "catching" every bug that came along while others would develop symptoms of excessive immune system activity such as autoimmune diseases or allergies. An understanding of the T-lymphocyte system of T-

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helper cells and T-suppressor cells as well as the above stated principles of PNI have finally answered those questions.

There are two types of lymphocytes: the T-cells, which are activated in the thymus gland (hence the name "T"), and the B-cells whose origins are in the bone marrow (hence the "B"). We will ignore the B-cells for now and concentrate on the T-cells. The T-cells are activated by the thymus, are the cells which appear to be most affected by the thymus, and seem to be the cells which are most affected by the chronic stress reaction.

In chronic stress, whether the response of the immune system is either increased or decreased depends on which function of the thymus gland becomes most inhibited. That is, if the stress affects the ability of the thymus to activate T-suppressors, then there will be relatively more T-helpers which will result in an overactive immune system and the potential for autoimmune disease, allergies, etc.

If the thymus ability to activate T-helpers is inhibited, then there will be more T-suppressors relatively speaking and this will result in a suppression of immune system function. It is the T-helper cells which are destroyed by the HIV (AIDS) virus and the resulting loss of immunity lowers the body's defenses to invading organisms, malignant cells, and a variety of other debilitating and fatal consequences result.

GAIT TORQUE PATTERNS, NTs, AND IMMUNE RESPONSE

Having patients spin around in circles was a rather cumbersome procedure, to say the least. Once it was realized

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that one direction of spinning caused a weakening effect of the infraspinatus and a positive TL to the thymus, but that both of these findings were neutralized by spinning in the other direction, a simpler, and it turned out, much more enlightening procedure was discovered.

In the concepts of "Centering the Spine" a right-footed gait pattern strengthening a weak muscle is associated with a need for more NE activity. Likewise, a left-footed gait pattern strengthening a weak muscle is associated with a need for more serotonin activity. Since NE is associated with immune system suppression (through the action of cAMP) and serotonin is associated with immune system enhancement (through cGMP), we tied these principles together to test the infraspinatus muscles and TL to the thymus against torquing patterns of the supine patient. In other words, we tested the infraspinatus and TLed to the thymus with the patient lying supine in three ways: 1) flat, 2) with DeJarnette blocks under the right hip and left shoulder (right foot gait pattern), and 3) with DeJarnette blocks under the left hip and right shoulder (left foot gait pattern).

The patterns of gait torquing and spinal torquing have been referred to as clockwise (CW), which is left foot forward gait, and counterclockwise (CCW), which is right foot forward gait. These CW and CCW patterns relate to the torque of the pelvis as viewed from above. The torquing of the pelvis in CW or CCW directions parallels the rotation of the electron poisoning curve around its mid-point as is seen in Figures 1a and 2a. The fact

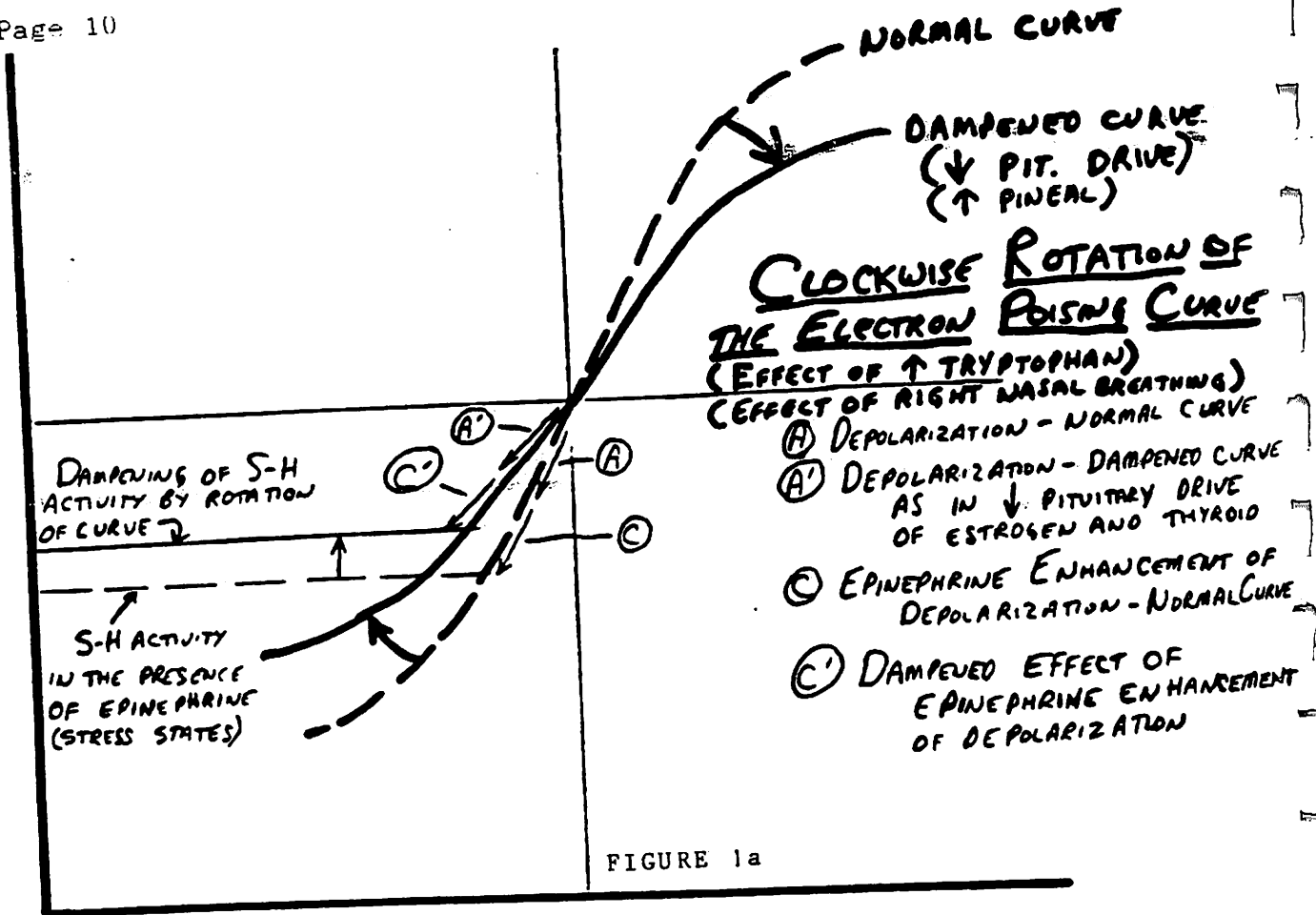


FIGURE 1a

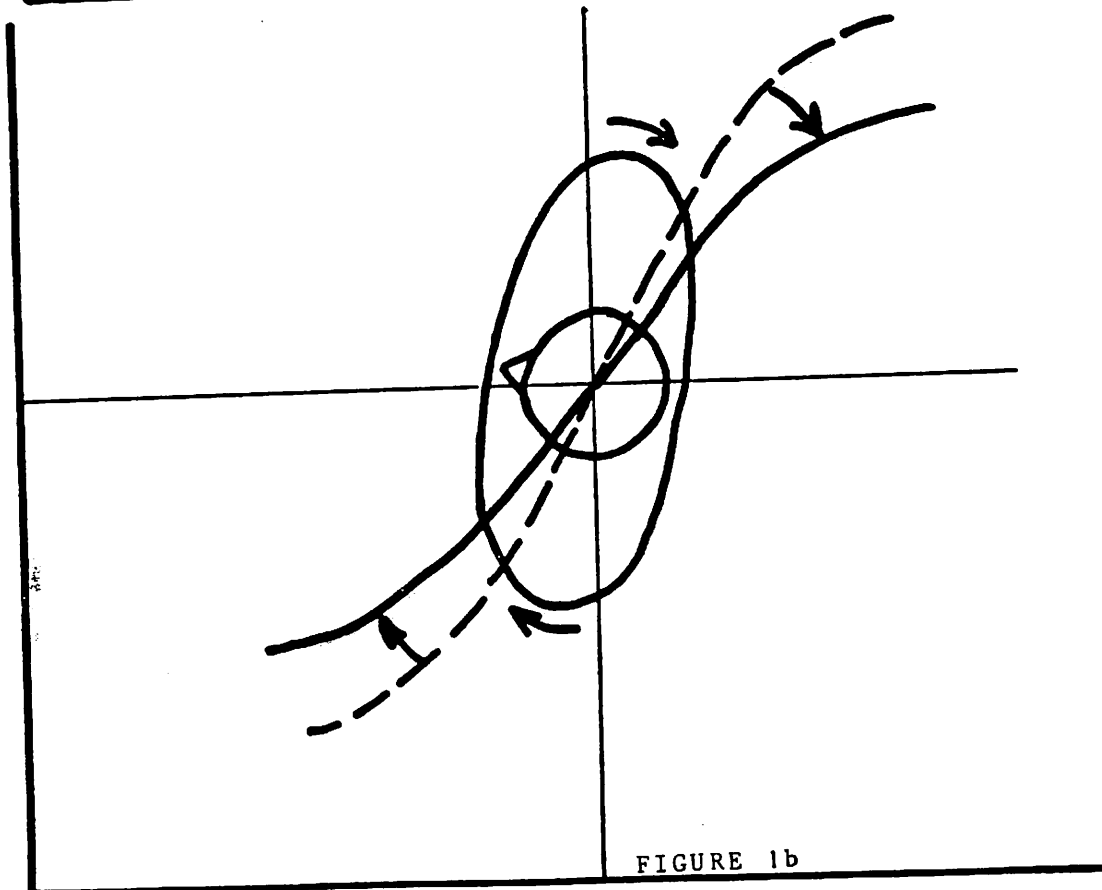
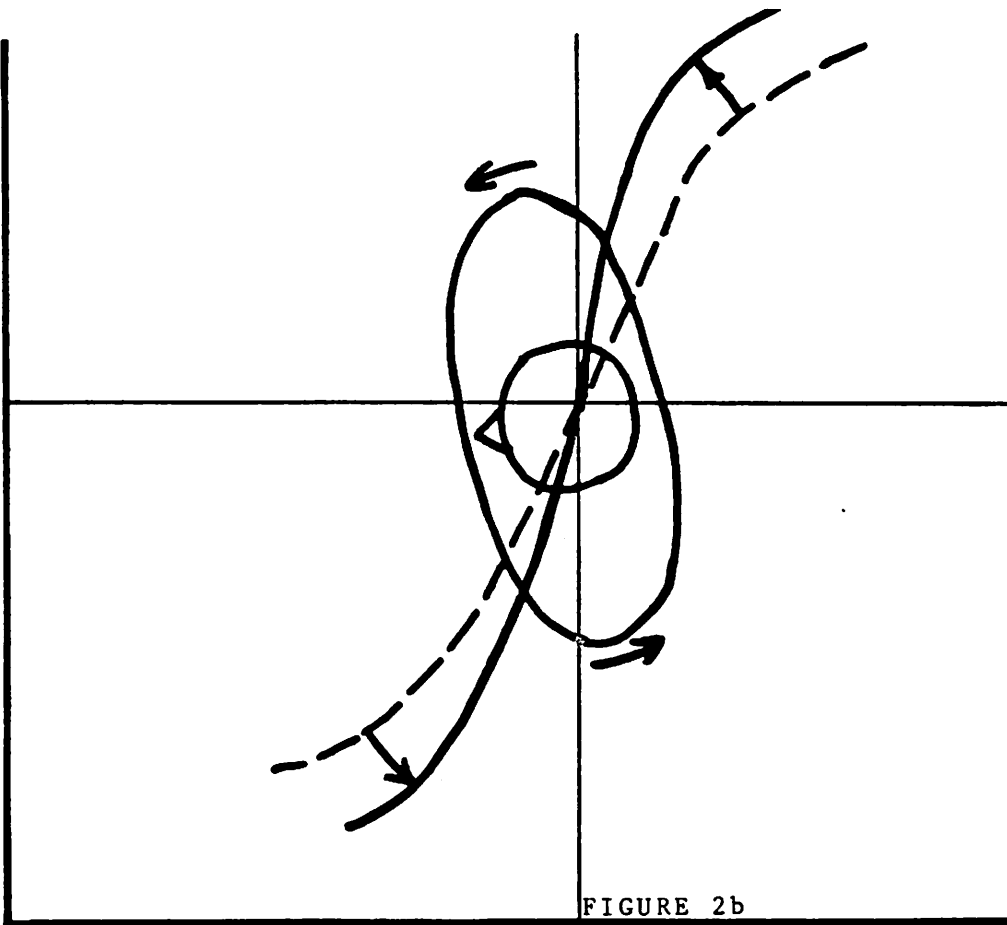
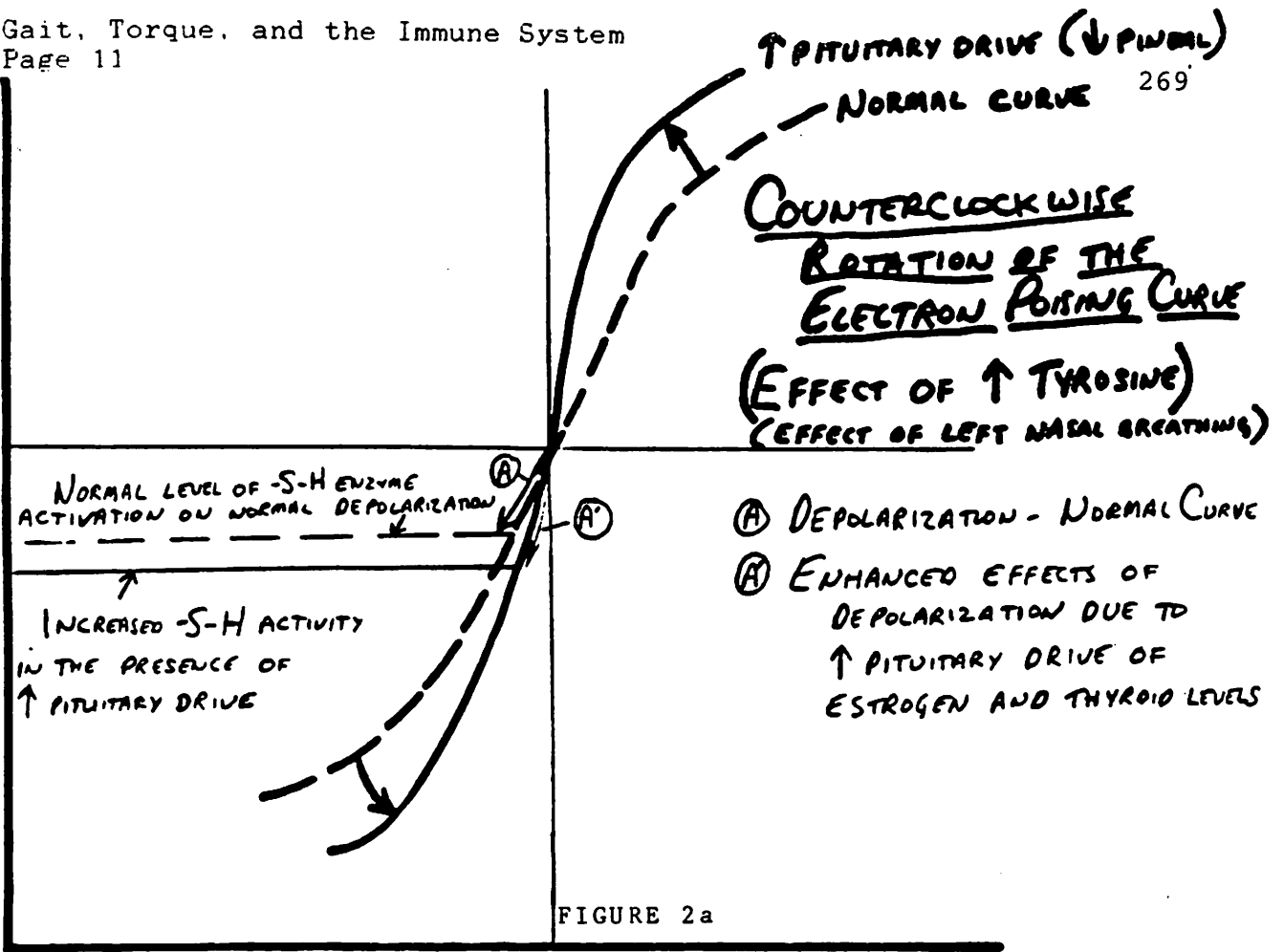


FIGURE 1b



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that the human body parallels the activity of the electron poisoning curve is at the foundation of the "Links Between the Nervous System and the Body Chemistry" as discussed at length in the previous papers by this author.⁶ The representation of the torquing of the body (pelvis) on the curve is seen in Figures 1b and 2b.

When there is obvious immune system involvement, there will usually be a weakness of one or both infraspinatus muscles in the clear. Also, the thymus will TL over the angle of Louis and make a gamma 2 weak muscle strong and possibly a strong muscle weak. In these patients, you can get a pretty good idea of the state of their immune system, whether it needs helping or suppressing, by employing the torque patterns with DeJarnette blocks and observing which torque pattern strengthens the infraspinatus and neutralizes TL to the thymus.

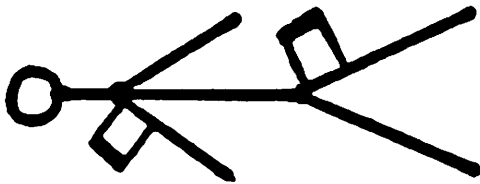
If CW torque (blocks under the left hip and right shoulder. See Figure 3a) strengthens the infraspinatus and neutralizes TL to the thymus, then this implies that serotonin will help the immune system toward normal function. Serotonin activates cGMP which enhances immune system function. Therefore, the patient whose infraspinatus strengthens with CW torque (left foot forward gait) has a need for enhancing the immune system (possibly by improving T-helper cell activity). This patient will usually show a strengthening response to one or more nutritional thymus tissue preparations. And by the same token, with this patient in the CW torque position, infraspinatus weakness and thymus TL can

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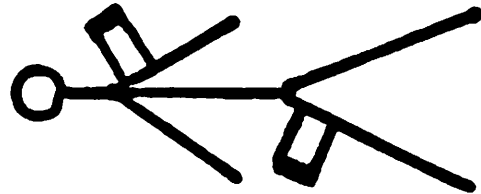
be caused to return by placing something in the mouth which will increase cAMP activity (which has the opposite function of the serotonin stimulated cGMP. This will be discussed further later in this paper.)

FIGURES 3A AND 3B

PATIENT SUPINE



LEFT-FOOTED GAIT PATTERN
CW TORQUE - SEROTONIN EFFECT



RIGHT-FOOTED GAIT PATTERN
CCW TORQUE - NOREPINEPHRINE EFFECT

In the patient with obvious excessive immune system activity, such as in autoimmune disease, severe allergies, and the like, there is a need to suppress immune system activity which can be done by increasing NE and cAMP activity. There will be in-the-clear weakness of the infraspinatus and positive TL to the thymus, both of which will be negated by CCW torque which is obtained by placing a block under the right hip and one under the left shoulder stimulating a right foot forward gait pattern as in Figure 3b. These patients will usually also strengthen when one or more nutritional thymus tissue products are placed in their mouth. Also, after treating the thymus neurolymphatic or other reflex area, the infraspinatus weakness and thymus TL can often be made to recur by placing something in the mouth which

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increases cGMP activity which has the opposite effect of the NE stimulated cAMP activity.

FINDING HIDDEN IMMUNE INVOLVEMENT

The use of torquing patterns to bring out hidden immune system involvements may be its most important aspect. We see many patients with strong infraspinatus muscles in the clear but who show strengthening of a gamma 2 weak muscle on thymus TL. We also see patients who have an indication of immune system involvement, either by symptoms, history, blood tests, or other clue, and yet show no infraspinatus nor any TL to the thymus in the clear. These patients have a "hidden" immune system involvement and are often some of the most difficult patients we see.

When we suspect an immune problem and there is no outward indication such as infraspinatus weakness or thymus TL, we place blocks under one shoulder and opposite hip and test the infraspinatus as well as TL to the thymus in this position. If nothing shows up, we reverse the blocks to the opposite shoulder and hip and retest the infraspinatus and re-TL to the thymus.

If one or both infraspinatus muscles weaken and/or TL to the thymus is positive in a torque position, we attempt to identify a factor which will negate the weakness. Sometimes this is simply the thymus NL at the right lateral 5th intercostal space. Sometimes it is one or more nutritional thymus substances. In some patients, however, we must address the problems associated with the torque pattern in order to correct the immune system

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involvement.

Patients whose infraspinatus muscles weaken on CCW torque and strengthen with CW torque need enhancing of their immune systems. These patients may require one or more of the nutritional thymus preparations. Since serotonin activates cGMP activity which enhances immunity, they may require nutritional treatment aimed at increasing serotonin. Treatment procedures designed to increase serotonin activity will also increase CW torque patterns of the body.

Structural and nutritional treatments aimed at normalizing the torque pattern in order to increase CW activity and normalize this immune system pattern are most important in patients who have other gamma 2 weaknesses which are strengthened by the CW torque. The reader is referred to "Centering the Spine" paper for all of the details of this treatment pattern, but to summarize, the patients who are strengthened by CW torque and weakened by CCW torque may need the sphenoid spread technique to increase pineal activity. They may need one or more of the nutritional substances which are necessary for the production of serotonin (tryptophan, folic acid, B-6, niacinamide, and/or iron) or the pineal's hormone, melatonin (all those just listed plus pantothenic acid). These supplements will all aid in improving the state of the immune system in these patients.

The patient who shows an infraspinatus weakness and thymus TL on CW torque is one who would have this weakness negated by CCW torque. Since NE is associated with the CCW torque, these

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patients whose immune indicators strengthen with CCW torque are those who would be benefitted by increased NE levels. NE activates cAMP activity which suppresses immunity. The treatments include pituitary drive technique and the nutritional factors which produce NE. These are tyrosine, folic acid, B-6, niacinamide, and tyrosinase-containing vitamin C. The use of these therapies is most indicated when all other gamma-2 weaknesses of the patient are also strengthened by CCW torque.

In addition to the above factors, any patient with any torquing patterns must be checked for iliolumbar ligament involvement. The iliolumbar ligament frequently shows up in these patients, as either a source of the original problem or part of a compensation to it.

SWITCHED PATIENTS AND IMMUNE - TORQUE PATTERNS

The most complicated patients are those who have immune indicators are aggravated by the same torque patterns that strengthen other gamma 2 weak muscles. These patients are stuck in the middle of gait, and cannot take a step with either foot, or produce either NE or serotonin, without aggravating one problem or the other.

For example, when a patient demonstrates immune indicators weakening on CCW, but other gamma 2 weaknesses (e.g., right latissimus dorsi, ileocecal valve open) strengthening on CCW, treatment to increase CCW torque patterns will improve the lat and the ICV but will further suppress the immune system. Likewise, treating to improve CW torque will enhance immune

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system function but will further weaken the lat and open the ICV.

The patients are usually "switched." The switching will most often be related to small intestine functions and/or hyoid involvement.

Small intestine treatment is indicated when any gamma 2 weakness is strengthened by TL to acupuncture point ST 19 and/or quadriceps and/or abdominal reflexes. These must be checked for with both eyes opened and eyes closed.

Other switching factors, besides K-27 and umbilicus contacts, are related to hyoid involvement. Simple challenge to the hyoid, most often in a lateral direction (i.e., right to left or left to right) will weaken a strong muscle in the presence of one or more of the following: folic acid need, TMJ muscular involvement, upper cervical subluxation, or a need for thymus and or parotid reflexes and/or tissues. Of course, the need for thymus tissue will have already been identified in the patients being discussed in this paper, and is usually not the cause of hyoid laterality in this type of switching.

After correcting the source of switching in these patients, the patient should be placed back into the torque position which previously weakened the infraspinatus and/or caused a positive thymus TL. If weakness is still present (the unswitching procedures will often cause spontaneous correction) correct the thymus via neurolymphatic activity, nutritional support, or other reflex activity.

CAFFEINE AND cAMP ACTIVITY

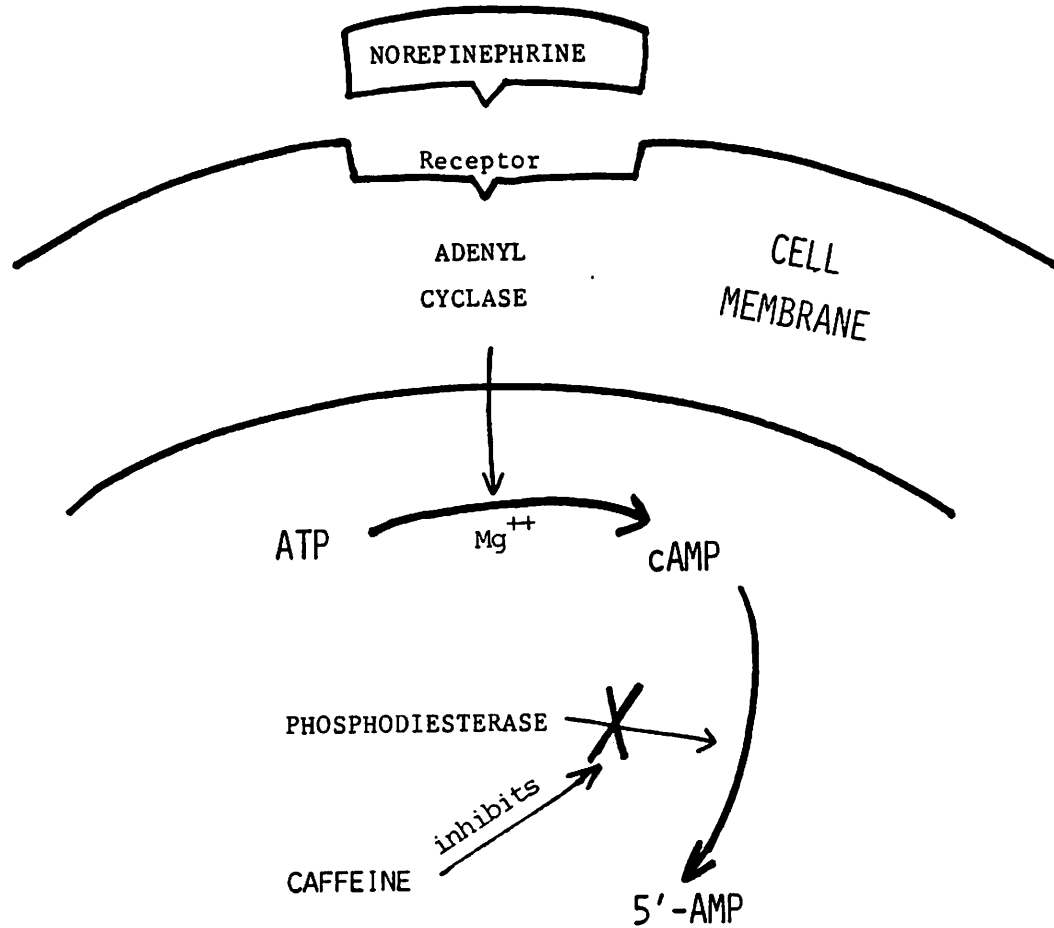
The second messenger system carries out the message from the extracellular messenger (neurotransmitter, hormone, etc.) inside the cytoplasm. cAMP is activated by norepinephrine, as previously mentioned, and has a suppressive effect on the immune system. We know that NE is associated with stress and is an "upper" in the nervous system. It was also mentioned previously that stress has an immunosuppressive effect. This, at least in part, is associated with the increased NE activity during stress states and the consequent activation of cAMP with the result being decreased immune system function.

As a neurotransmitter, NE contacts its receptor on the post synaptic membrane and activates an enzyme inside the cell membrane called adenylyl cyclase. (See Fig: 4) Adenylyl cyclase, in turn, causes AMP to become cAMP (its active form) and then cAMP carries out its duty in the cytoplasm to turn on or turn off various enzymes' functions.

Once cAMP has been activated, it must be inactivated to 5'AMP or it will continue to operate as cAMP, continuing to turn on or off whatever it does in that cell. The cAMP turn-off switch is called phosphodiesterase. So cAMP is turned on by adenylyl cyclase and turned off by phosphodiesterase.

Caffeine has its function as an "upper" by blocking the turn off function of phosphodiesterase. This allows unstopped activity of cAMP. Since cAMP is activated by NE, NE has its "upper" effects via cAMP as a second messenger. Caffeine

FIGURE 4
ACTIVATION AND INACTIVATION OF cAMP



increases cAMP activity, not by stimulating it as does NE via adenyl cyclase, but by prolonging its action by blocking phosphodiesterase breakdown of cAMP. The bottom line is that caffeine, from coffee, chocolate, tea, etc., increase cAMP activity, and in susceptible patients, this suppresses the immune system.

In patients who show infraspinatus weakness and/or thymus TL

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with CCW torque, the same weakness and TL pattern can be demonstrated in the flat-lying patient if coffee, chocolate, or other source of caffeine is placed on the tongue. In other words, if CCW torque causes a hidden immune system problem to show up, so will a source of caffeine.

In a patient who has a weak infraspinalis in the clear and/or thymus TL in the clear, and these are both neutralized by CW torque the positive effects of CW torque can be neutralized, even with the patient still on the blocks, by placing a source of caffeine in the mouth.

This is not to imply that caffeine, and its cAMP activating action will suppress the immune system in everybody, but this pattern usually holds true for the patient whose immune system is weakened by CCW torque. We have found recurrent thymus and immune system involvement, of the decreased immunity type, in these patients who would not alter their caffeine intake, whatever their favorite source of caffeine was. Caffeine restriction, at least temporarily these patients, becomes an important part of their overall program. Since so many patients do not seem to have a problem with caffeine and the CCW torque pattern, we do not universally restrict caffeine. But in the susceptible individual, it becomes important for the patient to get "over the hump" in the recovery process.

CONCLUSIONS

There are unquestionable bonds between the nervous system and the immune system. In fact, this should not surprise anyone

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who holds a holistic philosophy which advances the concept that all parts of the body are interrelated. There are also specific patterns of neuromuscular activity associated with specific patterns of immune system function. By using muscle testing as functional neurological evaluation, we are able to penetrate these patterns diagnostically and better understand our patients and the therapeutic options which are open to us.

It is hoped that the findings presented in this paper will become the basis for further understanding of the neurologically mediated effects of the immune system on musculoskeletal mechanics. Chiropractors and others who are interested in the neuromusculoskeletal system must lead the way in bringing simple, practical, and effective therapies based on the research of PNI to the millions of patients who are so in need of new approaches to allergy, autoimmunity, and infectious diseases so that they may enjoy a more optimal quality of life.

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ANTERIOR TARSAI TUNNEL SYNDROME
(A Differential Diagnosis & Treatment)

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ABSTRACT

The purpose of this paper is to aid the clinician in the differential diagnosis of the tarsal tunnel syndromes. Namely the post tarsal tunnel syndrome commonly referred to as just tarsal tunnel syndrome and the anterior tarsal tunnel syndrome. The structure, function, etiology, and treatment of both syndromes will be discussed. It is not the purpose of this article to detail the posterior tarsal tunnel since this is well addressed in A-K Literature. The anterior tarsal tunnel will be discussed in depth. I will differentiate the two separate entrapment neuropathies hopefully to yield a better understanding of the mechanisms of failure and correction.

It has been my experience after treating many and varied foot problems that I had a good working knowledge of tarsal tunnel syndrome (entrapment of the distal portion of the posterior tibial nerve at the level of the medial malleolus). After treating many dancers, some women who wear high heels habitually, and toddlers who were toe walkers, I began to find that they commonly had similar structural faults different than the usual tarsal tunnel syndrome. These structural faults responded favorably to the usual find it and fix it. It was random, but yet began to fit a pattern. I happened to be reading a book on Entrapment Neuropathies by David M. Dawson, MD; Mark Hallett, MD; and Lewis H. Millender, MD, and they described the anterior tarsal tunnel syndrome. This began to fit the picture of the many other foot problems I was seeing.

It became clear that there are at least two entrapment neuropathies at the ankle, each with its own different biomechanical faults that should be identified accurately and treated appropriately.

I will review some basic kinesiology and anatomy here since that will lead to working knowledge of the region, hence, a differential diagnosis. The ankle joint functionally is a hinge joint and its motion is basically flexion and extension. The talus fits snugly under the tibia between the lateral and medial malleolus. The lateral malleolus extends more inferior than the medial malleolus. The medial collateral or deltoid ligament, which is composed of the posterior tibiotalar, the tibiocalcaneal, anterior tibiotalar, and tibionavicular is very heavy, hence, the foot resists eversion structurally. The deltoid ligament also extends downward and sends fibers to support the arch so its integrity becomes doubly important. With the foot in dorsiflexion, the wider anterior portion of the talus rest between the two malleolus and the ankle is very stable. The posterior portion of the talus which is narrower goes into the mortice between the malleolus in plantar flexion which result is instability. Everything else being equal, this is the reason for instability in pes cavus, high heels, and dancers who are on their toes alot.

In a study on phasic activity of the intrinsic muscles of the foot, Mann and Inman concluded that these muscles act as a functional unit, also they have a significant role in stabilization of the foot during propulsion. Since habitually pronated feet are known to be unstable, it is not surprising that these investigators found the intrinsic muscle to be more active in such feet than they are in "normal" feet. Their conclusion was that the pronated foot requires more intrinsic muscle activity to stabilize the transverse tarsal and subtalar joint than do normal feet.

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This over activity of the intrinsic muscles leads one to consider the primary cause may be a weakness in the anterior or posterior tibialis, triceps, surae peroneus, longus brevis, flexor digitorum longus, flexor hallicus longus or the intrinsic foot muscles or any combinations of the weakness. I will not split hairs here, I think what is important is that the overacting on EMG investigation of the intrinsic foot muscles is secondary to weakness of the primary moves of the ankle joint, which in turn allows pronation and posterior tarsal tunnel syndrome. This same etiology, but with different muscles may lead to anterior tarsal tunnel syndrome, seen mostly in dancers, patients with pes cavus and toe walkers and women who wear heels frequently.

Posterior tarsal tunnel syndrome is encountered when the digital portion of the posterior tibial nerve is entrapped at the level of the medial malleolus usually inferior and slightly posterior. From this point distalward, this nerve supplies the sensory innervation to the plantar surface of the foot and the motor innervation to the intrinsic foot muscles. In contrast, the anterior tarsal tunnel syndrome is an entrapment of the distal portion of the deep peroneal nerve which lies anterior to the medial malleolus a couple millimeters medial to the dorsal pedis pulse and supplies sensory innervation to the dorsum of the foot at the first dorsal web space, and the motor innervation to the extensor digitorum brevis.

ANATOMY

The anterior tarsal tunnel is composed of the terminal portion of the deep peroneal nerve, the dorsal pedis artery, and the anterior tibial veins. The lateral containment of the anterior tarsal tunnel is the tendon of the extensor hallucis longus, medially and the tendons of the extensor digitorum longus and extensor hallicus brevis, laterally. Anteriorly, the anterior tarsal

tunnel is contained by the inferior extensor retinaculum (cruciate crural ligament). Posteriorly, it is bordered by the talonavicular joint, the talonavicular ligament and fascia.

SYMPTOMS

- Numbness and paresthesias at the first dorsal web space.
- Aching and or tightness about the ankle and dorsum of the foot.
- Nocturnal foot pain or tingling relieved by moving the foot about especially eversion and dorsiflexion.
- Atrophy and or weakness of the extensor digitorum brevis. The extensor digitorum brevis form a mound of tissue over the metatarsal bones on the lateral side of the foot.
- Tinel's Sign may be present over the injured nerve, most commonly at the level of the ankle near the dorsal pedis artery or slightly medially.
- Pain over the talonavicular joint.

ETIOLOGY

Trauma to the foot including improperly fitting shoes, high heels:

- Persistent toe walking in the child. A child should have a normal heel to toe gait within 6 months of learning to walk.
- Sudden violent plantar flexion and inversion of the foot such as inversion sprain.
- Weakness of the peroneal longus and brevis.
- Contracted anterior and or posterior tibialis. Test to determine if muscles can be turned off.
- Weakness of the triceps surae with overcontracted plantar flexors (flexor hallicus longus, adductor hallicus, flexor digitorum brevis).

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The head of the talus fits into a shallow socket in the navicular in front, and the calcaneus lateral and below. This joint composes the talocalcaneovicular joint. It resembles a ball and socket joint; however, with not the obvious movement of the ball and socket joint of the hip or shoulder. Supporting this joint from below is the plantar calcaneonavicular ligament or spring ligament. This spring ligament is placed under stress weight bearing, and supports the medial longitudinal arch below by connecting the sustentacular tali of the calcaneus with the navicular. Above, the joint is held by the talonavicular ligament. Directly above the talonavicular ligament is the anterior tarsal tunnel.

TREATMENT

Treatment consists of identification of the prime weakness usually triceps surae (gastrocnemeus or soleus) or peroneous longus/brevis. Make certain to investigate all types of weaknesses possible. Hidden weaknesses including reactive muscle, fascial stretch weakness, therapy localization, posterior or anterior tibialis will not turn off, etc. Fix the appropriate muscle weakness. Challenge the foot bones. Usually the navicular subluxates superior, the calcaneus subluxates anterior and the talus moves medially. Adjust accordingly (remember there is no rebound in foot challenge). Repalpate the pain over the superior aspect of the talonavicular joint, it will be gone if correction is done properly. The mechanism and correction of the anterior tarsal tunnel syndrome is almost the exact opposite of the commonly called tarsal tunnel syndrome.

I think we should make a distinction between the anterior tarsal tunnel syndrome and posterior tarsal tunnel syndrome. These foot problems are two very separate entrapment neuropathies and a careful differential diagnosis

and labeling should be observed. For many years, I found myself challenging, adjusting and fixing this problem without really understanding the mechanism at work. I hope this will clear up an area of possibly random finding and fixing, and put it into a more logical sequence.

- Related basic orthopedic neurologic tests:
- Achilles reflex/ankle clonus.
- Strumsky's Sign - stabilize the ankle with the patient supine and sharply dorsiflex the toes. This sign may indicate metatarsalgia (if you not only dorsiflex the toes but hold the foot in dorsiflexion and inversion, this may reproduce parestesias or pain).
- Homan's Sign - position for deep venous thrombosis of the leg. Pain is elicited in calf upon passive dorsiflexion of the foot.
- Thompson's Test - to detect achilles tendon rupture particularly the soleus portion. Squeezing the calf should produce plantar flexion.
- Anterior foot draw - for ligament instability, especially talofibular.
- Diabetes mellitus should be considered with an entrapment syndrome, especially when there is no history of trauma either recent or old.

Make certain to rule out L5 or S1 radiculopathy in the usual manner, since this may mimic the sensory, motor or both symptoms of either tarsal tunnel syndrome. The common peroneal nerve may also refer pain and mimic anterior tarsal tunnel syndrome. The usual sight for this lesion is at the level of the fibular head, if found, treat accordingly.

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AEROBIC & ANAEROBIC CATEGORY III

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ABSTRACT

This paper will give a method of challenging and correcting Category III disc lesions taking into consideration the site of disc failure and the biochemical nature of that failure. Using the Category III classification of disc involvement by therapy localization, then challenging the involved segment with respiratory component was useful but did not always render fast enough results for me. I began to experiment with a disc traction or disc pumping technique which seemed to help in the time needed to rehabilitate a true disc protrusion. Some patients went on to miraculous recovery and some did not. Some patients who had all the clinical symptoms of a disc protrusion including CT Scan, at first therapy localized (including all the enhancing therapy localization techniques) but still had obvious clinical signs and symptoms of disc protrusion.

DISCUSSION

In Spine Magazine, Volume 12, Number 1, 1987, there was an interesting article on the postmortem changes in ultra-structures of the Mouse Intervertebral Disc by Masanori Higuchi, MD and Kazuhiro Abe, MD, in which they describe the effects of nutrition and oxygen deficiencies of the mouse intervertebral disc. The nucleus pulposus consists of notochordal cells. The cytoplasm had abundant glycogen.

The annulus fibrosis can be divided into inner and outer regions. Collagen cells were predominate in the inner region. Fibroblast were predominate in the outer regions. The ^{major} differences between the nucleus and annulus for our purpose here is that the nucleus contained abundant glycogen and the annulus did not.

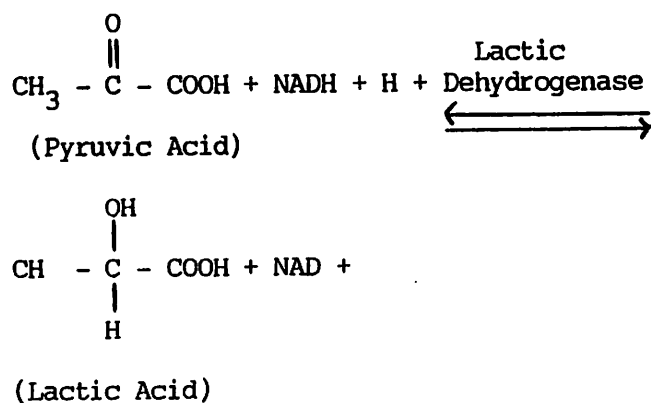
As you know, the intervertebral disc is an avascular structure which depends on diffusion or imbibition from the surrounding blood vessels through the annulus fibrosis and cartilage end plates. The experiments that were done demonstrated that the cells on the periphery of the annulus were most oxygen dependent. The more central cells of the annulus were less oxygen dependent. The nucleus or notochordal cells were hypoxic in nature and depended on anaerobic glycolysis, where the more peripheral cells were aerobic in nature.

After you identify a Category III block and correct the lumbar vertebrae, challenge the spinous process for anaerobic function, pump the spinous 2 or 3 pumps per second. If the muscle weakens, you have a failure of the anaerobic capacity of the I.V.D. If you get no response on the anaerobic challenge, pump the disc in an aerobic manner, one pump every other second or so. If this produces a weakness, the disc is failing in its aerobic capacity.

If the disc fails on an anaerobic challenge, i.e., rapid pumping of the spinous process, have the patient therapy localized to the pancreas neurolymphatic: I have found this so far to be the most frequent counter. If the pancreas neurolymphatic counters first try a source of pancreatic enzymes sometimes zinc, pantothenic acid, or niacinamide. It has been promoted for years that

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the enzymes have an effect on tissue damage, edema and disc lesions, and don't orthopedic surgeons sometimes get results with chymopapain injection into the disc. Wally Schmitt, D.C. had advanced this mechanism to Kinnin mediated allergies. Be sure to check small intestine function when Kinnin allergy is found. I feel that in these anaerobic disc cases, this Kinnin allergy is the chemical failure. In the case of pantothenic acid or niacinamide, I feel that it is a failure of anaerobic glycolysis since the end product of anaerobic glycolysis is lactic acid and lactic acid is a biochemical dead-end street which is reversible to pyruvic acid. From pyruvic acid a number of biochemical reactions are open.



The "Law of Mass Action" states that as the end products of a chemical reaction build up, the rate of reaction approaches zero. When you challenge the disc anaerobically, you drive the reactions to failure and high levels of pyruvic acid and hydrogen atoms are formed which stops the reaction. Lactic acid diffuses readily and acts as a kind of a sinkhole for glycolytic end products to continue longer; however, the co-factor niacinamide is necessary for the reaction to proceed. Pantothenic acid is necessary for the motion of co-enzyme A, the acetyl-COA and the further metabolism or escape of pyruvic acid.

In the case of aerobic challenge (i.e., slow pumping means that the respiratory bursts of the phagocytes are producing too much superoxide), have the patient therapy localized to the thymus neurolymphatic if this counters the aerobic challenge. I have found that a source of superoxide dismutase with catalase to be most effective. This is probably due to the fact that the outer layers of the annulus are exposed to more oxygen; hence, more prone to the free radical sequence. In the classic case of degenerative disc disease, CT Scan almost always reveals a circumferential bulging of the annulus. This bulging combined with dural torque may pull the spinal cord or nerve root into the disc and cause a rancidity reaction of the spinal cord or meninges. If the weakness returns next visit, test with glutathione and balance the electron poisoning system. I use Dr. Wally Schmitt's protocol and have found it extremely effective. If the weakness recurs, check chlorox, aspirin, etc., as per Dr. Schmitt. I will not describe those methods in this paper but refer you to Dr. Schmitt's work. Once you have eliminated this source of disc degeneration from free radical production, the patient will recover nicely.

I have used for years many different nutrient preparations for disc problems in my office, including pancreatic enzymes, trace minerals, manganese, Vitamin E, C, Zinc, etc., and never achieved consistent results and never knew exactly which ones to use and when.

I feel that the more we look at the body as a hologram and stop trying to separate its part, the simpler it becomes. This is a rather simple technique and has been used over the course of 8 or 9 months on over 50 disc patients, most of which are of the chronic and difficult category, with excellent results.

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APPLIED KINESIOLOGY NUTRITIONAL TESTING

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ABSTRACT: Observing the change in muscle function after a patient chews or sucks on nutrition is a frequently used method of nutritional testing in applied kinesiology. The International College of Applied Kinesiology has taken the stand that evaluating nutritional needs by testing muscle function should only be done when the patient stimulates the gustatory receptors with the substance being tested. This method of nutritional testing has become an important addition to the standard methods used in determining a patient's nutritional need(s). This paper emphasizes the reason individual patient consideration should be done, and that this method must be correlated with other means of nutritional need diagnosis. The effects on the body from gustatory stimulation are discussed, as well as some of the neurologic pathways of the gustatory system.

The method of testing nutrition generally accepted by members of the ICAK and supported by the organization is discussed. The effects of some nutritional deficiencies that have been found in applied kinesiology -- such as ribonucleic acid and dehydration -- are also discussed. More basic research, properly designed, is needed to further understand the mechanisms at work in applied kinesiology nutritional testing.

A system for evaluating nutritional effects on body function has been developed in applied kinesiology by Goodheart.^{50,51} The system appears to provide additional information about how nutrition, or possibly adverse substances, may work with or affect body function. It is designed for use in conjunction with the physician's general knowledge of nutrition, and laboratory

and physical diagnostic findings. It is important that the examiner using this technique be thoroughly knowledgeable about the usual methods for determining nutritional needs.

Applied kinesiology nutritional testing appears to reflect the nervous system's efferent response to the stimulation of the gustatory and olfactory nerve receptors by various substances. The nerve pathways causing change in muscle function as observed by manual testing are unclear; however, there is considerable evidence in the literature of extensive efferent function throughout the body from stimulation of the gustatory and olfactory receptors. There is also evidence of afferent modification of gustatory sensitivity and central nervous system interpretation of gustatory impulses ultimately modifying functional change as a result of oral stimulation. Applied kinesiology nutritional testing enables a physician to give individual consideration to each patient's nutritional needs. To properly apply this method of testing, one should be thoroughly familiar with the nervous system's role in nutrition, and also be proficient in manual muscle testing.

As one begins a serious study of nutrition outside applied kinesiology, it is easy to become very confused. Consulting ten different authorities on specific questions about nutrition may provide seven, eight, or even ten diverse philosophies leading to different therapeutic approaches, or perhaps to no treatment at all. Extremes go from the belief that if a person eats balanced meals no nutritional supplements are ever needed to recommendations of so many high-potency supplements that one would hardly need eat regular food, except for fiber.

Philosophies about nutrition vary from mega-dosages of numerous supplements to low-potency products of natural origin only. Some recommend that specific nutritional products routinely be given with certain medications to offset any side effects¹²⁸; others recommend no medication, with nutrition taking its place; still others recommend minuscule dosage of homeopathic remedies for the treatment of disease. There are vitamins, minerals, isolation of natural food products (such as the essential fatty acids), herbs to treat almost any condition, and Bach flower remedies for mental and emotional conditions.^{9,23,150}

Why are there so many philosophies with different treatment approaches to something as essential to our life as the food we eat? The answer cannot be put into a simple statement. There are many reasons for the confusion that reigns among nutritional authorities. Paramount among these is that all nutritional factors have not even been discovered yet, and it is not known exactly how the body uses many nutritional products. As we progress with our discussion, keep in mind that the first description of treating scurvy with ascorbic acid was done only fifty years ago, by Parsons.¹¹³

The applied kinesiology method of evaluating changes in body function as the result of nutritional stimulation fills a specific void in the conondrum of nutritional diagnosis. The method consists of stimulating the gustatory nerve receptors by having the patient chew or inhale²² the substance to be evaluated, and then manually testing a muscle for change. The muscle may appear stronger or weaker, depending upon the type of

evaluation being made and the muscle's neurologic association with the substance stimulating the gustatory receptors. This system of testing is controversial. One reason for this is that there have been many modifications of Goodheart's original description. Some, rather than have the patient stimulate the gustatory receptors with the substance being tested, have the individual hand-hold the substance or lay it on the belly; some even have the patient hold a bottle containing the substance to be tested.^{11,12,39,115,116} These modified systems are frequently taught to lay people^{11,12,39,141,146} who often do not have the anatomical knowledge necessary for accurate muscle testing, nor do they have a nutritional background or general diagnostic ability.

The testing of nutrition as advocated by the International College of Applied Kinesiology is a discipline limited to the tested substance stimulating the gustatory nerve receptors, combined with accurate and specific muscle testing. The information derived from these tests must then be correlated with a standard diagnostic work-up by a person licensed in the healing arts to be a primary health care provider. The approach discussed in this paper is designed to be an adjunct to standard nutritional evaluation, **not** to take the place of it. Those who have the expertise to properly test nutrition, as described by the ICAK, should not use this method as a sole approach in evaluating nutrition and/or substances harmful to the body.

This writer believes that the modified testing procedures for nutrition -- including hand-held, laying it on the skin, touching various areas of the skin, and teaching the material to lay

people -- are potentially detrimental to the health of the subject being evaluated and should be eliminated. The abuses of manual muscle testing in evaluating nutrition have sunk so low that this writer once heard a woman at a nearby table in a restaurant say, "If you don't believe me, let me show you." She then had a man at the table stand up and hold a sugar dispenser in his hand. She proceeded to have him hold his other arm out and attempted to pull it down. He was a strong individual, and she almost lifted herself off the floor before she was able to pull his arm down. Then came the statement, "See -- I told you it would make you weak."

Applied kinesiology nutritional evaluation is indeed a revolutionary method of determining nutritional needs. In my twenty-seven years of practice, I have seen many changes take place in what is considered the routine nutritional approach for health problems. Twenty-five years ago I was increasing fiber content in the diet of patients with colon disturbances. On three different occasions when I took patients off the bland, refined-sugar diet prescribed by their allopaths, I was called a stupid quack and accused of endangering the life of my patients. Fortunately, the patients continued my therapeutic approach and had an uneventful recovery, in spite of the diatribe against me and my procedure. Today, even television commercials and the National Cancer Institute¹⁵⁷ emphasize the need for fiber in the diet. Those same doctors who called me a quack now use the approach I used twenty years ago.

There are many reasons that nutritional needs should be

evaluated on an individual basis. Applied kinesiology adds to the physician's nutritional knowledge the ability to determine, to a certain extent, the effects of various nutritional products on the specific individual being considered. Furthermore, it enables one to evaluate the difference between nutritional products that may appear to be the same according to the product's description, but act differently from individual to individual.

People are different. Everyone does not require the same nutritional program regarding the food eaten and possible supplementation taken. Williams¹⁵⁴ points out that researchers must begin considering biochemical individuality in the study of nutrition. Individuality may have a genetic basis with different body composition, enzymatic patterns, and endocrine balance. Williams presents a hypothetical group of ten men (group 1), all of average height, with the same foot size. They have the same amount of hair on their heads, and an average tendency to put on body fat. They consume the same amount of alcoholic beverages, have the same sex urges, and their digestive tracts react the same to food. They all have normal teeth, without cavities or plaque buildup. Finally, they all have the same emotional reactions to the same daily stresses.

Contrast this group with another hypothetical population of ten men (group 2). In this group is one man who has lost all his hair. Another seems to gain weight just by thinking about food. Another has long, narrow feet and fingers. One supervises 100 men on a production line, with a very tight productivity schedule to meet. Another has no sex drive, and still another is a salesman with his two-martini lunch schedule.

It seems that the minimum and maximum daily requirement of nutritional complexes can be easily figured for group 1, but what are the needs for group 2? If there is considerable individuality among people, how has man survived for so long before there was any study of his nutritional needs? Is there an innate self-selection of the food needed by the body? Williams points out the body's wisdom with the illustration of an individual who has no knowledge about nutrition and little or no tendency to gain weight. If, during a ten-year period, he gains five pounds, his self-selection of food has regulated his caloric intake to a minimum error. During this period, if he were moderately active he would have consumed approximately 12,000 pounds of moist food. If there was a 1% error of caloric intake over the ten years, he would have gained or lost 120 pounds. With the five-pound gain, his body wisdom was adequate in regulating food intake to an error of less than 1/20 of 1%.

There is abundant data indicating that man and animals have innate self-selections to determine quantities and quality of food that will provide optimal health. Although this mechanism is constantly functioning to some degree and will be discussed later, it is not an answer to the nutritional question; there are many factors that interfere with proper self-selection.

In-depth study of nutrition is done to indicate the nutritional products needed for optimal health and for the treatment of various types of body dysfunction and disease processes. Why do many of the studies end with opposing conclusions? If complete data is available, one may find that one

study used a natural vitamin product while the other used a synthetic one. One may have used a higher potency vitamin than the other, or the studies were biased by group selection. Conflicting conclusions may be traced to the differences in manufacturing nutritional products. One company may use heat in processing, and another cold. Keep in mind that all nutritional co-factors have not yet been discovered. Can heat or exposure to air destroy some essential co-factors present in natural food products? On the other hand, what might be missing from synthesized products? Can man really manufacture complete nutritional products? In a nutritional practice, it becomes obvious that supplements vary from manufacturer to manufacturer regardless of the labels indicating the same supplement types and concentration. Prescribing the proper supplement for a patient from the physician's knowledge of nutrition is complicated by the variation between manufacturers' products.

Choice of proper nutrition from knowledge of its effects in the body is further complicated by current labeling laws. This is aptly pointed out in a health bulletin from the University of California (Berkeley).⁵ Labels provided by the food processor often give little information about the product, and sometimes they can be frankly misleading, making it worse for the average person to read the label than to not. Many are misled by the term "natural"; it has no legal meaning. A product labeled "natural" - - unless it is meat or poultry -- can be highly processed, packed with additional fat and sugar, and loaded with preservatives.

It is difficult for the average person to determine the amount of sugar in a product. According to the FDA, "sugar" means

sucrose (table sugar). It does not cover other forms of sugar, such as glucose, fructose, corn syrup, and products high in sugar concentration. The ingredients of a product are listed in descending order according to weight. A breakfast cereal may list its ingredients as rolled oats, brown sugar, corn syrup, sugar, and raisins, followed by other items. Note that the rolled oats are listed first; however, when the sugar products are added together, sugar may well be the major item in the product.

Buzz words, such as "enriched" and "fortified," lead one to believe that a product is higher in nutrition than the original product when, in fact, it may be lower. "Enriched" is used when foods have lost nutrients during processing and then had them replaced; it does not mean that all lost nutrients have been replaced. For example, white flour loses at least 50%-80% of many nutrients. Iron, niacin, thiamine, and riboflavin may be replaced, but other nutrients lost in the milling process -- such as fiber, zinc, and copper -- are not.

Today there is more interest in nutrition by the general population and members of the healing arts than ever before. Most serious students recognize the difficulty in thoroughly understanding this complex subject. There is no single factor available to indicate the proper diet and/or supplementation needed for a particular patient's prophylaxis or therapy. Many factors must be considered to arrive at the optimal approach. Applied kinesiology manual muscle testing is a new and viable approach when used in combination with other methods of investigation about which the reader should be knowledgeable.

When used with this discipline, it adds a new dimension to understanding nutrition and the body's needs.

Contributing to an optimal evaluation and recommendation are history, physical examination, laboratory findings, biochemical individuality, any drugs the patient may be taking,¹²⁸ interaction of vitamins and minerals, and a thorough knowledge of nutritional effects on the body. Added to this thorough consideration is the effect nutrition and food products have on body function as indicated by manual muscle testing. Each consideration in this list provides additional information for proper supplementation or diet. No single factor is adequate, since each has its limitations.

Blood tests provide information about the quantity of substances, such as protein, calcium, phosphorus, potassium, and other items in the bloodstream. When indicated, blood tests can give valuable information about the function of the body and its nutritional status.^{77,151,152} Urinalysis¹⁵³ and other specialized body chemistry tests should be performed and evaluated when necessary. One has to put the results of the tests into proper perspective. When we analyze the test results the question has to be asked, "How is the body using the available material?" One can liken the distribution of food to the population to that of the bloodstream distributing food to the body. The amount of food available to a city can be calculated by combining the amount of food locally produced with that brought in by trucks, trains, and other modes of transportation. A comparison of the city's population needs and the food available may indicate that everyone in the city is obtaining optimal nutrition. This, of

course, cannot be considered true unless the individuals in each household are evaluated for their use of the available nutrition. It may not be available to some because of economics, and to others because of poor food choice. When all individuals in the city are considered, there may be substantial nutritional deficiency even though it appears that food is available. The bloodstream is similar to the stream of trucks and trains coming into the city. The nutrition may be available in the bloodstream, but is it being used by the individual cells?

Hair analysis is another means of evaluating nutrition, especially minerals. There is considerable disagreement about the viability of this method. Because it is a relatively new approach, some consider that there is a lack of reference normals for the mineral levels in hair.¹³³ One must be certain that there is data reproducibility from particular laboratories. Early in the use of hair analysis this author had difficulty correlating changes when re-testing a patient after therapeutic efforts. The laboratory's reproducibility was evaluated by mixing a patient's hair sample and sending half of it to the laboratory under one name and the other half under another name. Correlation between the two reports was poor. This same indictment has been made by Barrett¹⁰ but contradicted by Schoenthaler.¹³² Today most laboratories have good reproducibility. Schoenthaler presents a statistical method for evaluating the reliability of laboratories. Anyone using hair analysis as a method of nutritional evaluation should take it upon himself to investigate the laboratory being used.

Applied kinesiology nutritional testing, like the other considerations, is not all-encompassing and must be correlated with other methods to determine nutritional need. In a status statement published in 1983^{73,74} and updated in 1987, the International College of Applied Kinesiology states, "Nutritional evaluation [by muscle testing] should be done only with the subject tasting the substance. It is also necessary to evaluate other factors which may influence the perceived muscle strength. Confirming diagnostic criteria for the need of any nutrition should be present from the patient's other diagnostic work-up, which may include history, type of dysfunction, laboratory tests, physical diagnosis, and dietary inadequacies. . . . An adequate educational background is needed in evaluating nutritional needs and manual muscle testing. The use of manual muscle testing by lay salespeople has created problems due to their untrained status and enthusiasm to sell their products."

Some have described the testing of nutrition by manual muscle testing as a simple procedure,^{39,115,141,146} which it certainly is not. One must be aware of the various factors that influence manual muscle testing, such as subluxations, lymphatic drainage, intrinsic neurologic dysfunction, balance of the meridian system, and function of the cranial-sacral primary respiratory system. These are only a few of the many factors that have been found to influence the manual muscle test. They must be taken into consideration when evaluating an individual for his nutritional needs.

Nutritional testing with the modified methods of holding the nutrition in the hand, laying it on the body, holding a bottle

that contains the substance, and touching various "reflex points" about the body is often the main subject of a book or booklet produced for general public reading. In some instances, these procedures are taught at weekend seminars that may be sponsored by companies trying to sell their nutritional products. In fact, some nutrition companies have taught lay people to do muscle testing to convince prospective customers to buy the product. When one tries to "prove something" to another individual with manual muscle testing, errors often result. The examiner may unconsciously change the parameters of the test (or may not even know what the parameters are), and make the test come out the way he expects due to his enthusiasm for the procedure.¹³⁵ In no way should the modified procedures be confused with applied kinesiology methods. The skilled applied kinesiologist uses manual muscle testing to evaluate nutrition as an adjunct to standard laboratory and physical diagnostic methods. All factors of the examination should correlate, or something is being missed. Research sponsored by the ICAK¹⁴⁷ points out that manual muscle testing to evaluate nutrition, whether chewed or held in the hand, is not a viable approach in and of itself.

The primary method of testing nutrition in applied kinesiology is to have the patient chew the substance to be tested. The influence on the body appears to be the result of stimulating the gustatory and olfactory receptors. Oral absorption may also influence the body.

In simple daily observation, one can see many instances in which chewing nutrition quickly changes an individual. A hungry,

crying child quiets immediately upon nursing or obtaining other food. An irritable hypoglycemic individual calms immediately upon chewing food, long before there can be any rise in the blood sugar level from the substance.

The importance of the gustatory system on health is illustrated in a report by Pangborn¹¹² about a Russian study by Murskii wherein dogs were "killed," then resuscitated. Early recovery of the gustatory function was always associated with successful resuscitation. In cases where recovery was difficult and cortical cells did not regain full function, the ability to distinguish food from non-foods was sometimes disturbed. The early development of taste sensation emphasizes the importance of gustatory function. The newborn human infant is able to distinguish water from sugar solutions.^{96,110} Fetal sheep can taste, as measured at the chorda tympani nerve, as early as 100 days into the gestation period (term = 147 days).²¹

When chewing nutrition changes muscle function as perceived by the manual muscle test, the change is almost immediate. It seems evident that the effect is due to stimulation of the gustatory and olfactory receptors. Oral absorption of some of the chewed material may stimulate remote receptors. As will be discussed later, certain substances enter the bloodstream almost immediately by oral absorption.

Most of the research done on testing nutrition by applied kinesiology methods has been clinical correlation of muscle testing results when specific nutrition is chewed, in correlation with the clinical and laboratory examinations previously mentioned. The literature has many examples of how gustatory

receptors and oral absorption change body function. Research shows widespread interaction within the nervous system and the body in general from nutritional stimulation. Most of this research was done prior to the clinical knowledge of the effect chewing nutrition has on manual muscle testing. Further research must be done, taking into consideration the influence of nutritional products on the nervous system and the great amount of neuromuscular, organ, and gland interaction. Most of the basic research has been done on the control of food and water intake under normal and abnormal conditions. There have been group and isolated studies done on innate self-selection and its effect on health and diseased states. While these studies have nearly all indicated that self-selection enhances health, we will also consider how education, environment, emotions, and status satisfaction override proper innate self-selection.

Progressive research on applied kinesiology nutritional testing should not be limited to the gustatory receptors. Food and water intake is regulated by a combination of peripheral and central systems. Stevenson¹⁴⁴ presents an overview of this integration. Chemoreceptors, such as the glucoceptors in the hypothalamus and liver and liporeceptors monitoring the fat depots, provide information about the body's reserves. It has been suggested that glucoceptors provide a short-term control of food intake relative to immediate energy needs, while the liporeceptors provide a long-term control for the maintenance of body weight. Additionally, the osmoreceptors, stretch receptors, and baroreceptors reflect blood volume and extracellular fluid

volume. Even thermoreceptors play a role in regulating food intake. It is well-known that the environmental temperature influences food intake in man and animals. Hypo- or hyperactivity of endocrine glands, such as the thyroid⁷⁰ and adrenal,⁴² modifies taste sensation and reaction to stimulation.

How a substance tastes to an individual does not appear to have any bearing on applied kinesiology nutritional testing. The results of the test appear to depend on how the nervous system reacts physiologically to the substance. The sensation of taste as subjectively evaluated by the subject is a hedonic one and appears to be evaluated on another level.⁸⁷ The attractiveness of food, its texture, and an individual's previous experience play a major role in what he chooses to eat. A fresh apple is identified as such by its odor. Peel and mash a raw apple and a potato to eliminate the texture characteristics. It will be difficult to determine which is which when each is tasted with the nose and eyes closed. Cold milk, beer, and soup are distinctly different in taste from hot milk, beer, and soup. One easily recognizes the optimal temperature of wine or meat. Changing the visual stimulation of the food by adding tasteless food coloring increases or decreases its attractiveness. Try serving blue-yolked eggs or black cereal! The change in desire is due to a learned response, not the dark color, since black caviar and olives rank among the most desired delicacies.

Stimulation of the gustatory receptors elicits specific preferences in drinking or eating or -- on the other hand -- in rejecting particular foods. Pfaffmann,¹¹⁸ in discussing the "pleasures of sensation," emphasizes the hedonic aspects of

sensory stimulation and suggests that sensory input to the hypothalamus and other structures of the limbic system may be involved in hedonic and reinforcing features of stimulation, as compared with cognitive and arousal functions. Some items tested with applied kinesiology methods fit into the pleasurable realm, while others are distinctly unpleasurable. Typically, sugar will cause a hypoadrenic individual to test weak on its ingestion, while a vile-tasting product for adrenal supplementation will cause a previously weak associated muscle to strengthen.

Those who use manual muscle testing to evaluate nutrition should be thoroughly familiar with the nervous system's role in nutrition. Although much of the basic research was done prior to the use of manual muscle testing to evaluate nutrition, it provides a foundation for further basic and clinical research to understand the action taking place.

THE NERVOUS SYSTEM'S ROLE IN NUTRITION

Much of the neurophysiologic knowledge of nutrition's action on the nervous system comes from animal studies in which surgery was performed to establish esophageal or stomach fistulae so that food could be put directly into the system, bypassing the oropharynx, or could go through the oropharynx and not enter the stomach. In addition, information has been obtained by removing the adrenal, pancreas, thyroid, and other glands to create deficiencies and observe the change in the self-selection of foods. The nerves of taste are recorded in animals to determine their response to various types of gustatory stimulation. Considerable information has been obtained by injecting animals

with insulin and other substances to determine the change in the animals' desire for food and in body function, such as nerve responses.

Much can be learned about the effect of nutrition on the nervous system from animal studies, but great care must be taken in extrapolating the animal information presented here and elsewhere to man. Regarding animal studies, Moulton¹⁰¹ states, "The chemical senses show extraordinary diversity in the geometrical disposition of their organs, in their relative degrees of development, and in their structural interrelation in different species. It is clear that their relative biological significance must vary widely from group to group. This fact alone implies that extrapolation of findings concerning their interrelations and functions from laboratory animals to man must be viewed with more than the usual caution."

There are variables in taste function that are unique to various species. For example, a bird will not drink a fluid that is a few degrees above its body temperature, yet cooling the fluid down to freezing does not decrease its acceptability. Birds will rapidly notice a change in the surface texture of grain; however, they appear indifferent to viscosity. A thick viscous sucrose solution is accepted as well as pure water.⁸⁷

A laboratory rat quickly selects sucrose or saccharin over other "non-sweet" substances. The cat and dog prefer sucrose, but they are indifferent to or reject saccharine solutions. The cat is indifferent to both solutions. There are even species differences when specific sugars are considered.⁸⁷

When gustatory chemoreceptors are stimulated with the basic tastes of salt, sweet, sour, or bitter solutions, oscilloscope recordings of the chorda tympani and glossopharyngeal nerves are different in goats, sheep, and calves.¹⁴

The studies of the nervous system's role in nutrition, regardless of whether in man or animal, reveal the constant effort to maintain homeostasis. There is recall within the nervous system of how different nutritional or other substances have previously affected the body.

LEARNED RESPONSE

Both man and animals react to gustatory stimulation on an innate and experiential basis. A better understanding of how the nervous system reacts to gustatory stimulation has developed from experiments in which animals are given a choice of foods. Often the animal is first made deficient in some nutrient and then given food choices that will or will not supply the deficiency. These are called self-selection experiments. Diet choices in self-selection experiments may be classified as one of the following: (1) simple preferences, (2) learned appetite, or (3) true hungers. Simple preferences have no relation to nutritive value; they are based on the hedonic value of flavor, odor, consistency, or some similar pleasurable quality. Learned appetites are based on an animal's experience that a certain food will give it a feeling of well-being. Hungers are based directly upon the physiologic need, and require no learning process.¹³⁷ The principal difference between learned appetites and true hungers is that in the former an animal must have had a previous

experience of well-being from eating the food, and in the latter there is a true nutritional need for the food for which no learning process is required.¹³⁹

Animals develop a memory for the beneficial or detrimental effect of various foodstuffs.⁸⁷ Rats depleted of a specific nutrient such as thiamine, when offered a choice between an adequate and a deficient diet, will select much more successfully when flavor has been added to one of the choices. Apparently they can rapidly associate the physiological need with the flavor of the diet. This identification of toxicity or benefit of a foodstuff by means of taste is a serious problem in the use of poisoned baits for rodents or other animals.

In learned response, the initial proper selection of food to satisfy the animal's deficiency is innately proper, and the vitamin becomes associated with the taste. In Harris et al.'s study,⁶⁰ flavor was added to the vitamin-sufficient diet. After the rats became accustomed to it, the flavor was moved to an insufficient diet. The rats moved to the diet containing the familiar flavor and became vitamin-deficient again. A rat can be "re-educated" to choose whatever diet contains the vitamin, provided the diet possesses a distinctive characteristic.

A comparison between wild and domesticated animals reveals that wild animals make choices in the amount and kind of food they eat. Wild animals stop eating when their nutritional requirements are met and they are satiated, regardless of the foodstuff's appealing flavor. Domesticated animals are self-indulgent and more concerned with self-pleasure than optimal function.⁸⁷ Maller⁹⁴ studied the differences in food selections

of domesticated and wild rats. The domesticated rats' choices for sensory pleasure were evident in sweet solutions, diets high in fat content, and negatively-flavored food. When the food was flavored with quinine sulfate, a domesticated rat decreased its food intake; there was no change in the wild rat's intake. Henkin,⁶⁵ in commenting on Maller's work, states, "If we can extrapolate [this] data to man, who must be the most domesticated of all animals, this kind of phenomenon certainly seems to hold to a great extent in various diseases. The alcoholic is an excellent example of this. He chooses to obtain calories from alcohol and avoid nutrients and it is only with a great deal of effort that this pattern can be changed." Pfaffman¹¹⁹ discusses the question, "Is taste necessary?" He concludes that it is for animals, especially when not looked after by man. It is becoming more evident that man needs to learn how to look after himself.

REGULATION OF FOOD INTAKE

Regulation of the amount of food and water intake in man and animals is an excellent example of the numerous mechanisms at work and the accuracy with which the body regulates itself through the nervous system. Jacobs and Sharma⁷⁶ describe and support ". . . a model in which energy balance is a critical factor in the control of food intake. When the animal is in balance or in surfeit, the metabolic properties of ingested food are critical and when it is deprived the sensory properties receive priority in regulating intake." The experiment was primarily done with dogs. Dogs that were satiated ate for calories; dogs deprived of food prior to the evaluation ate

primarily for taste, to satisfy the specific nutritional needs of the body. The type of food selected depended on the animal's deficiency. Regulation of food quantity and intake was not based on caloric deficit over short periods.⁷⁸

The interplay of neurologic factors at different levels in the regulation of water intake is demonstrated by Janowitz and Grossman's study⁸⁰ of dogs with esophageal fistulae. There are three mechanisms that regulate the amount of water a water-deficient dog will drink. When the water is sham-drunk -- that is, it cannot reach the stomach because of being diverted at the esophageal fistula -- a dog will drink 2.5 times as much water as the deficit. When water is allowed to reach the stomach, a dog will drink 1.2 times the deficit. If water in the amount of the deficit is put directly into the stomach without rinsing the pharynx and the dog is allowed to drink within ten minutes, it will drink the amount of the water deficit. If it is not allowed to drink for fifteen minutes after water is put into the stomach, the dog will not drink any water.³ This study confirms that stretching of the gastric receptors is the first mechanism that regulates water intake.¹⁴⁰ It also shows that moistening of the mucous membrane in the mouth gives at least temporary satisfaction,¹⁵ causing cessation of drinking. Finally, if enough time is given for absorption of the water, the osmoreceptors, stretch receptors, and baroreceptors reflect the extracellular fluid volume¹⁴⁴ and cause the dog not to drink.

It is obvious that there are numerous factors operating in the control of how much water is drunk. It is important to

consider stimulation of the receptors in the oropharynx; the same rapid change takes place in applied kinesiology nutritional evaluation. If water is administered to a rat without passing through the oropharynx, the rat is not fully satisfied.³² When control of the amount of water drunk is limited to the oropharynx receptors, the accuracy is sometimes amazing. Adolph¹ deprived dogs, prepared with esophageal fistulae, of water. When the dogs were allowed to sham drink, they satisfied their thirst with a single draft of water in five minutes or less time. The amount of water sham-drunk was precisely the amount of their water deficit.

Patients with numerous muscular weaknesses are often dehydrated. Goodheart⁴⁹ observed a generalized strengthening in these patients on manual muscle testing when they drank a glass of water. The improved muscle function is immediate, and appears to relate with the same neurologic mechanism that causes a dog's thirst to be satisfied when sham-drinking.

Two mechanisms regulate caloric intake.⁸⁰ When there is a deficit, the taste is potentiated to increase intake, which is a short-term response. Over a longer term it becomes a learned component of intake.⁷⁵ The short-term component ensures adequate caloric intake under varying conditions of need.⁸¹ The learned component is a wholly neural mechanism tending to maintain active ingestion, regardless of caloric need. When a learned component is present, satisfaction of the gustatory mechanism appears to be necessary regardless of caloric need. Glucose fed intravenously does not inhibit food intake in the dog.⁷⁹ This learned response accounts for the increased intake of food in the presence of obesity.

Stimulation to the oral receptors does not appear to have a major role in regulating the amount of food eaten. Additionally, the bulk of food is not the factor regulating the amount ingested. Animals will eat the correct number of calories even though the food is increased in bulk many times by water added to a liquid diet or cellulose added to a solid, powdered diet. They will also consume the right caloric intake when high concentrations of quinine are added to make the food bitter. Teitelbaum and Epstein¹⁴⁵ summarize their observations this way: "What we are emphasizing is that although oropharyngeal sensations are essential when the animal must find food and identify it, they are not essential when the animal's only problem is how much to eat."

Epstein³³ developed a method whereby rats can feed themselves directly into the stomach, bypassing the oropharynx. This eliminates stimulation to the oropharynx and the somesthetic sensations produced by food in the mouth and pharynx. It also reduces the proprioceptive feedback from the act of eating. The elimination of stimulation to the oropharynx does not interfere with the quantitative control of food intake; on the other hand, choice of food and motivation to eat are greatly impaired. The rat feeding intragastrically by this method will adjust its food intake to receive the same nutritive amount when the solution is diluted with water. A rat eating 30 ml of food per day will adjust its intake to approximately 60 ml per day when the diet is diluted to half its intensity with tap water.³² At high dilutions the animal eats more meals per day to obtain the necessary amount

of food.

The regulation of food and water intake provides an excellent illustration of the great amount of interplay within the nervous system for the regulation of nutrition. In applied kinesiology nutritional testing, we are concerned primarily with gustatory and olfactory receptor stimulation and oral absorption. The animal studies show that taste and smell are not necessary when the only problem is how much to eat, but they are central when the animal must select the proper food.¹⁴⁵

SELF-SELECTION IN NUTRITIONAL DEFICIENCY

Numerous studies have been done in which animals have experimentally been made nutritionally deficient in various substances to determine how they would cope with the problem. The deficiency may be made by withholding an essential nutrient, or by surgically removing a gland(s) such as in an adrenalectomy. The object is generally to provide the animal with a selection of foods, some of which contain the needed nutrient and others devoid of it to determine if the animal will self-select the proper food for its health. Successful self-selection of food has been demonstrated in many animals, including pigs, dairy cows, sheep, chickens, pigeons, monkeys, rats, and others.¹²³ Other studies evaluate the effect of stimulation to the gustatory receptors by sectioning the nerves of taste¹¹⁷ and bypassing the oral and nasal nerve receptors to determine the animal's change in food preferences and aversions.¹⁸ Human studies have primarily been limited to observation of patients with various health problems.

Sodium. Sodium deficiency is usually developed in laboratory animals by adrenalectomy. Richter and Eckert¹²² gave adrenalectomized rats continuous access to a solution of sodium salts (chloride, lactate, and phosphate). The rats selected these salts, gained weight, and survived. When tested with a selection of non-sodium salt solutions (chlorides of magnesium, aluminum, and potassium), the rats did not select these solutions and died. When tempted with commercially available sodium-free substitutes, adrenalectomized rats clearly avoided them in favor of the sodium solution.¹⁰⁶

The rats' choice to drink a sodium solution in sodium deficiency is clearly due to stimulation of the oropharyngeal receptors. Several studies have been made with Epstein's³³ method of rats feeding themselves intragastrically via a tube inserted through the oropharynx to the stomach. This enables the testing of self-selection without stimulating the oropharyngeal receptors. Under normal circumstances, rats will avoid high concentrations of sodium chloride; however, when feeding intragastrically, bypassing the oropharyngeal receptors, they cease to avoid the sodium chloride solution. The rats maintain quantity precision of eating but lose the choice of foods and motivation to eat.

Sodium-deficient rats choose sodium over a non-sodium solution within fifteen seconds of being given a choice.¹⁰³ This indicates that the choice is based on nerve receptor stimulation, and is not a learned response. It appears that there is a specific neuroresponse for the deficient sodium ion, which may be due to a higher response of the receptors in the presence of

sodium deficiency. Richter¹²³ found the average taste threshold for sodium chloride in normal rats was 0.0055%; for adrenalectomized rats it was 0.0037%, about 15 times lower. He considers the minute amount of salt obtained from the solutions for which the adrenalectomized rats first manifested a preference was so low it could not have had a physiologic effect. This may be true in reference to absorption of the small amount of sodium chloride, but later studies that will be discussed show physiologic change, such as glandular secretion from gustatory stimulation independent of absorption. The desire of an adrenalectomized rat to choose a sodium chloride solution over other drinking fluids is so strong that it has become a test to determine the completeness of adrenalectomy in research.⁴¹

Increased salt intake of sodium-deficient rats depends upon the animal's ability to taste the solutions offered.¹¹⁷ Sectioning of the chorda tympani, glossopharyngeal, or lingual nerves alone does not result in the loss of sodium appetite. When all three nerve supplies are sectioned, taste sensation is greatly reduced or eliminated. Rats made sodium-deficient under these circumstances do not increase their salt intake and consequently die.¹²⁴

Untreated patients with Addison's disease have increased taste sensitivity, roughly 100 times more acute than that of normal subjects.⁶³ When they were treated with desoxycorticosterone acetate (DOCA), serum sodium and potassium returned to normal but did not alter the taste threshold. When treated with prednisolone, the taste threshold returned to normal

within the first day, frequently before any change in serum electrolyte concentration or body weight. Henkin and Gill⁶³ state, "The nature of the effect of carbohydrate-active steroids on taste is obscure. It may be related to the effect on nerve function."

The increased taste sensitivity in patients with Addison's disease is contrasted in a study by Nachman and Pfaffmann.¹⁰⁵ They compare the impulse recording from the chorda tympani nerve in sodium-deficient rats that increased their intake of sodium chloride with normal rats that showed a clear aversion to drinking the solution. The afferent gustatory signal revealed no difference between the two groups. They concluded that the mechanism for increased sodium intake is a central one, in which the excitability of a group of cells changes to respond differently to the unaltered afferent sodium chloride signal.

There appears to be no question that stimulation of the gustatory receptors in sodium deficiency initiates the selection of a sodium solution over others, and influences the amount of solution consumed. Studies of salt-deficient sheep with esophageal fistulae reveal that sham-drinking of salt solution is partially effective in satiating sodium appetite. The amount sham-drunk is dependent upon the concentration of the solution offered.²⁰ The type of sodium solution consumed when more than one is offered also seems to be regulated by the gustatory receptors. Sheep with parotid fistulae ingest NaHCO_4 more readily than they do NaCl , which may be related to their loss of alkaline saliva.²⁹

Dogs with esophageal fistulae begin sham-drinking immediately

when hypertonic sodium chloride is administered intravenously. When Pitressin(R) is administered before the sodium chloride, there is an inhibition of the sham-drinking for ten to twenty minutes.¹⁵ Pitressin(R) is the trade name for the anti-diuretic hormone; the precise mechanism by which it acts is unknown.⁵⁵ When there is a loss of the antidiuretic hormone because of removal of the posterior lobe of the pituitary gland, animals excrete large amounts of urine, become dehydrated, and soon die. When the animal is given access to unlimited water, it consumes huge amounts -- sometimes twice the body weight in water per day, keeping it alive and in good health.¹²³ The wisdom of the body is again demonstrated in studies of rats made hypertensive by kidney encapsulation. In general they avoid salt solutions in favor of those with no salt.⁴³ The effect of gustatory stimulation is widespread throughout the body. Another example of how gustatory receptor stimulation with sodium stimulates change in function is the comparison of the results of irrigating the oral cavity of rats with tap water or a saline solution. Urinary excretion was immediately measured by chronically implanted vesico-urethral catheters. Buccal stimulation with water caused an increase of urinary flow as early as the first minute. By the sixth minute the urinary flow was two times the control level. Oral stimulation with the saline solution depressed urinary flow within the first minute.

Self-selection of sodium in sodium deficiency is probably better understood than any other self-selection in deficiency. There are probably many factors that influence sodium selection.

For example, hypothyroid rats maintain a spontaneous salt appetite when given a choice between water and a sodium chloride solution.⁴⁴ Studies indicate that regulation of sodium intake is from afferent impulses from gustatory receptors¹⁰³ and long-term absorption.¹⁵ Afferent impulses from long-term absorption come from throughout the body and/or gut. These impulses are mediated by central control.¹⁰⁵ The dilemma in presently understanding the neurologic mechanism is pointed out by Denton in his study using gastric intubation and esophageal fistulae in cattle, goats, and sheep. "A restless salt-deficient animal ingests 2-3 liters of hypertonic NaHCO_3 in a single drinking act over 2-3 min, and this is followed by a precipitate decline of motivation and loss of interest. An increase of plasma sodium concentration follows 15-30 min later. This observation contrasts the fact that intracarotid infusion causing a large increase in sodium concentration of the blood passing through the brain for 10-15 min has neither evident effect on motivation nor any satiating effect. The nature of the central component of the mechanism of satiation of salt appetite, including the relation, if any, to the self-stimulation areas is unknown."³⁰

It appears that the self-selection of sodium in sodium deficiency and other neurologic observations made in animals are applicable to man. Richter¹²⁴ reports on a three-and-one-half year-old boy who was taken to Johns Hopkins Hospital for study of precocious sexual development. After eating the regular hospital diet for one week, the boy died. An autopsy revealed both adrenal cortices had been almost completely destroyed by tumor growth. Questioning the mother revealed that feeding the child had been a

problem. He desired large amounts of salt; he would literally eat it by the handful, and did so until the hospitalization restricted his salt intake. The loss of salt was the reason for his death.

In another case a 34-year-old man with marked Addison's disease put approximately a 1/8" layer of salt on his steak and used nearly 1/2 glass of salt for his tomato juice. He even made lemonade with salt!¹²³

Sugar. Proper self-selection is demonstrated in preference for a needed substance or avoidance of a substance that may be detrimental to the body. Both sides of the preference-avoidance curve are demonstrated in animals by self-selection or avoidance of sugar. Adrenalectomized rats with marked diabetes avoid carbohydrates and increase fat and protein intake on a self-selection basis. This results in a loss of their diabetic symptoms, and the blood sugar falls to a normal level.¹²³

Considerable neurophysiologic action appears to take place from sugar stimulation in the oropharynx. Nicolaidis¹⁰⁹ points out that many diabetics carry sugar products to combat hypoglycemia and malaise as a result of too much insulin treatment. Within about twenty seconds after putting the sugar product in their mouth, they feel better. The effect is pre-absorptive. It cannot take place from absorption into the bloodstream because of the short time factor and the small amount of sugar product. Studies have shown that when rats are given labeled glucose and expired CO₂ is measured at the end of one hour, only 2% of the glucose load is entirely catabolized.¹⁰⁸

Nicolaidis¹⁰⁹ states, "Obviously the improvement is due to the reflex released endogenous glucose which provides the emergency fuel until the intentional absorption of ingestance."

In vivo blood glucose levels were measured in rats when the buccal mucosa was stimulated with sucrose dilutions or with a saccharine solution.¹⁰⁸ In less than a minute hyperglycemia was observed, and sometimes a secondary elevation was observed four to seven minutes later. These elevations were even observed in twelve rats that had esophageal ligatures. Stimulation of the tongue and the buccal mucosa with water most often did not modify the blood sugar level, but it did in some cases. Nicolaidis¹⁰⁸ points out that perhaps these findings explain ". . . some pathological curiosities such as the dramatic disappearance of malaise in patients with iatrogenic or idiopathic hypoglycemia immediately after they ingest a little sugar. It is quite possible that in this hyperglycemia reflex, neural or more likely, neurohumeral efferents mobilize glucose from carbohydrate reserves. . . ." He further points out that the hyperglycemic reaction occurs more clearly in animals with esophageal ligatures, and that there may be a dual mechanism involving these reflexes since hypoglycemia or hyperinsulinemia occurs initially after gastrointestinal stimulation with sweet solutions.

Conscious dogs with esophageal or stomach fistulae were sham-fed glucose or tap water to determine insulin secretion in a study by Hommel et al.⁶⁹ When the glucose was orally administered and recovered from the stomach fistula there was no rise in glucose; however, there was a rise in immuno-reactive insulin (IRI) in the peripheral venous blood within 2.5 minutes, which

was the earliest test made for increased IRI. When glucose was administered to the esophageal fistulae, bypassing the oropharynx, the IRI values increased only after the tenth minute. These results suggest the mobilization of insulin on the basis of nerve impulses from gustatory stimulation. An increase in insulin was also observed from sham-feeding tap water orally; however, the increase in IRI was smaller than with the glucose test. Topical anesthesia of the oral mucosa will eliminate the effect of increase in circulating insulin caused by sham-feeding of glucose or tap water.¹⁰⁷ "Glucose is only a weak stimulus for insulin secretion in the carnivorous dog, and further physiologic factors must be of importance."⁶⁹ When glucose was administered intravenously, the increase in IRI was smaller than after oral or stomach administration. The authors⁶⁹ point out that insulin release after electrical stimulation of the vagus nerve results in a time similar to that of oral administration.

Water stimulation of a rat's tongue or water drinking in man often results in a hypoglycemic response, which is abolished by vagotomy. The highest amount of insulin is released upon the oral administration of glucose. The next highest is with glucose given intragastrically, and lowest is when the same amount of glucose is administered IV.¹⁰⁹ In most cases when hypoglycemics chew refined sugar, nearly all muscles of the body will temporarily test weak. This reaction may be due to the insulin release as a result of stimulating the gustatory receptors.

The body reacts differently to equal amounts of glucose when administered orally, by IV infusion, or directly into the stomach

because of stimulation to the nervous system at different levels. From the intestinal level the messages seem to be endocrine, but at the oral level they seem to consist mainly of nerve receptor stimulation to which the central nervous system responds with neuroendocrine secretion. When the oral receptors of esophageal-ligated rats are stimulated with a sweet substance (sucrose or saccharin), there is a hyperglycemic response as quickly as one minute after the oral stimulation. Post-absorptive effects cannot account for this change because of the ligature and the fact that there is a similar reaction to sugar and saccharine stimulation.¹⁰⁹

Valenstein¹⁴⁹ comments regarding the work of Nicolaidis¹⁰⁸ that it is interesting that the sweet taste of non-caloric substances, such as saccharin, may produce rapid hyperglycemic responses. This enhances a study he and co-workers completed. A significantly higher percentage of animals that had been drinking a saccharine solution rather than water succumbed when given an LD50 dose of insulin. They had speculated that oropharyngeal stimuli might trigger "preparative metabolic reflexes," which in the case of a sweet taste may produce insulin secretion.

The sweet taste of saccharin sometimes elicits a response similar to sugar in studies. When it does, there is usually a quantitative difference. Smith and Capretta¹⁴² found that rats learn to avoid saccharin when it is provided for them without food association, presumably because of its non-nutritive value. When rats are given saccharin in combination with food, they do not learn to avoid it, presumably because of the continued opportunity to associate its taste with a deficit relief.

Although the sweet taste is important in early insulin response, as indicated by the saccharine-producing secretion of insulin, ingestion of unflavored bulk can also initiate the early insulin release.¹⁰⁹

Animals select their food source according to its nutritive value. Adolph² examined the effects of flavor. He attempted to have rats ingest non-nutritive substances, such as clay and cellulose, by adding saccharin. This led to a very slight acceptance of these materials. When nutritive-flavoring materials were added, their ingestion by the rats increased. Adolph concluded that it is difficult to fool a rat into accepting a non-nutrient with artificial flavoring. We can look at many current food products and see that man is more easily fooled.

There are two insulin elevations when sugar is administered orally, one almost immediately and the second some ten minutes later. When nutrients are administered intragastrically or intravenously, only the second phase of insulin secretion appears. In animals with esophageal fistulae, insulin secretion occurs despite the absence of any food reaching the stomach.¹⁰⁹

Many factors appear to be influenced by glucose stimulation of the oropharynx. Changes in metabolic rate developed as a result of oral stimulation with sucrose in fasting rats. The metabolic rate remained high for more than ten minutes, while controlled water stimulation caused no change.¹⁰⁹

Protein. When animals are fed a diet very high or low in protein, food intake is depressed. When the diet is low in protein, the low food intake is usually attributed to the

inability of such a diet to support normal growth. Harper⁵⁷ indicates that food intake in a low-protein diet is depressed because of the animal's limited ability to dissipate energy, with a vicious circle developing. When the protein intake is high, the reduced food intake appears to result from a large heat increment which, according to the thermostatic hypothesis of food intake regulation, can inhibit food intake. There may also be an accumulation of amino acids or some products of amino acid metabolism that decrease food intake. The decreased intake is transitory; after a few days the rats return to normal eating.

Rat studies have not shown a strong self-selection for different types of protein¹³⁸ when there is self-selection for the proper amino acid to correct a deficiency; it appears to be a sense of taste, not of smell.⁵⁷ Rats given the choice of foods where casein is provided for protein will avoid the casein because of its taste and die.³²

Vitamin B. The self-selection of diets containing the proper component of the B complex to correct a deficiency appears to be from stimulation of the gustatory receptors.⁶ Harris et al.⁶⁰ gave thiamine-deficient rats a choice of two diets, one devoid of the vitamin and the other barely adequate. The deficient rats consistently chose the adequate diet, whereas non-deficient rats ate the two diets indiscriminately. If the sufficient diet contains more than an adequate amount of thiamine, the deficient rats will eventually begin to eat from both diets. The same type of self-selection is present for riboflavin and pyridoxine. The choice is not one of simple preference, because normal animals do not choose the vitamin-rich diet except on a random basis.¹³⁷

When a diet is chosen to correct a deficiency, a learned response develops.^{127,129} Rats deficient in thiamine, riboflavin, or pyridoxine were given a diet rich in the needed vitamin and uniquely flavored. After becoming accustomed to the diet the needed vitamin was switched to the same base food, but the flavor was eliminated. Another diet was available; it did not have the added nutrient, but it did have the flavor. The rats switched to the vitamin-deficient, flavored diet. When the diet with the needed vitamin was again flavored, they returned to the flavored and enriched diet. This indicates that the learned response developed from the needed nutrient is maintained for some time. When the learned response is applied to humans, one can see why it is often difficult to change dietary habits, even when the change is toward more nutritious food.

If the learned response is not deeply established, rats will seek a diet to improve their nutritional deficiency. When thiamine-deficient rats are presented with different food selections, they repeatedly change their diet.¹²⁶ In a natural situation this would maximize the rats' likelihood of encountering a diet with thiamine. If the selection of novel diets contains no thiamine, a preference for the familiar diet develops after two to four days.

When vitamins are regulated in an animal's diet to be either sufficient or deficient, the animal chooses food that can be metabolized properly when deficient vitamins are present, or it avoids food that cannot be metabolized when the necessary vitamins are not present. A rat on a diet entirely lacking

vitamin B will self-select large amounts of sucrose for the first eleven days; when the vitamin B deficiency begins to be manifested, there is a decrease in sucrose selection and an increase in fat.¹²³

Calcium. In the presence of calcium deficiency there is an increased self-selection on a natural basis. When parathyroidectomized rats are fed a regular diet, they develop tetany and usually die within a few days. When offered a calcium solution on a self-selection basis, they take sufficiently large amounts to keep themselves alive and free from tetany. They also have a reduced appetite for phosphorus solutions, which is in keeping with the decreased rate of phosphorus excretion in hypoparathyroidism.¹²³

On a self-selection basis, pregnant rats increase calcium and sodium phosphate slightly during pregnancy and very markedly during lactation. When the litters are weaned, the sodium phosphate appetite drops immediately; calcium drops to the original level after several weeks. Fat intake also increases slightly during pregnancy, with a very large increase during lactation. Rats on a self-selection diet during pregnancy and lactation produced babies that weighed the same as control rats on a stock diet, but there was a 20% lower food intake during pregnancy; it was almost 50% lower at the height of lactation for the self-selection rats. The conclusion is that rats on a stock diet desiring a lot of calcium had to consume a large amount of the entire diet to obtain the increased calcium.¹²³

The same self-selection appears to be present in the calcium-deficient human if it is not interfered with. Children with

parathyroid deficiency have been reported to show a craving for chalk, plaster, and other substances with a high calcium content.¹²³

Influence on enzyme production. Stimulation of the oropharyngeal receptors is an important first step in the digestive process. Enzyme release is appropriate to the type of food the digestive system is about to receive. Optimal digestion and health are sacrificed when the oral phase is not present, such as swallowing nutritional supplements in tablet form.

Taste has an influence on the exocrine function of the pancreas. Dogs were prepared with both gastric and intestinal fistulae so food could be diverted from the body at the stomach or intestine. Previous experiments had shown that food entering the stomach had no influence on pancreatic secretion. When the dogs were fed kaolin (hydrated aluminum silicate) there was no pancreatic response, whereas sugar was effective in increasing both enzyme content and flow. A high fat diet resulted in a greater lipase flow, but a high carbohydrate diet had no effect on amylase flow. It was concluded that taste and diet are involved in modifying the exocrine functioning of the pancreas.⁸⁷

Sham-feeding in dogs causes mobilization and discharge of enzymes from the pancreas within one to five minutes after feeding, which continues for approximately thirty minutes.^{85,107} Although gastrointestinal hormones -- such as secretin and cholecystokinin -- mediate pancreatic response, the hormonal action clearly depends on the interaction with the parasympathetic nervous system. Anticholinergic drugs or surgical

denervation will interrupt the hormonal effect.¹⁰⁷

Sucrose, quinine, or citric acid were used to stimulate the tongues of dogs with gastric and intestinal fistulae.^{13,107} Since salivary stimulation produced no pancreatic secretion, it was used as a control. Initially the stimulation of the three substances produced pancreatic secretion. The dogs, however, learned quickly that no food would be forthcoming and the response dissipated. Naim and Kare¹⁰⁷ state, "It is likely that the cephalic phase of pancreatic secretion is complex function of higher processes than simple reflex stimulation, and that taste stimulation is only a tool of these processes."

Toxic aversion. Man and animals rapidly associate post-ingestion effects with the flavor of the diet. If there are adverse physiologic effects from eating an item, a learned response of aversion to repeating the act is rapidly associated with the flavor and odor of the foodstuff so that the act will not be repeated.⁵⁹ This identification of toxicity is of benefit for preservation of the species. It is a serious problem to man in his effort to control rodents and other animals with various forms of poisoned baits.⁸⁷ There are two methods of getting animals to select poison for pest control, in spite of their innate ability to avoid harmful substances. (1) The poisons are mixed thoroughly with their usual food to mask most of the taste. This is especially applicable when the animal is very hungry. (2) If the poison is highly insoluble in the saliva, it will not adequately be tasted.¹²³

Studying rats' selection between lithium chloride, which is toxic, and sodium chloride, which may be lifesaving, shows

evidence of the sophistication within the nervous system to select between substances that have a similar taste. Recording from individual fibers of the chorda tympani nerve shows that NaCl and LiCl applied to the tongue respond almost identically.⁴⁰ Since the nerve response and apparently the taste sensation are almost identical between the two substances, their study in self-selection when there is a sodium deficiency shows the rat's discriminatory ability through his gustatory receptors.

Adrenalectomized rats showed a specific appetite for NaCl, and gained weight only when this salt was given. Other salts that contained sodium were also chosen by the rats, but toxic salts such as LiCl were avoided. In this experiment normal rats failed to manifest an appetite for any of the salts offered.⁴² In another study the rats freely drank from solutions of NaCl and LiCl, but after a short time they developed an aversion to drinking the LiCl,¹⁰⁴ indicating that it is necessary for the rat to experience the toxic effects of the substance before a learned response develops.⁵⁹

ORAL ABSORPTION

Consideration of what causes the change in muscle function, as observed by the manual muscle test, during chewing of nutrition and other substances must include oral absorption. Most of the studies regarding oral absorption have related to the effectiveness of various drugs when administered sublingually as opposed to being swallowed or given by muscle or intravenous injection. The results of these studies indicate that many substances are more effective when administered for oral

absorption. In some cases, the drug must be administered by sublingual or buccal absorption to avoid passing through the liver, which all substances absorbed from the stomach, intestine, or rectum must do. The basic complex of some substances, when swallowed, is destroyed by gastric or other digestive juices. A number of drugs that show poor or erratic absorption from the gastrointestinal tract are absorbed better via the buccal or sublingual route.⁴⁸ Numerous types of drugs are administered sublingually or buccally, including cardiovascular drugs, steroids such as estradiol, progesterone and testosterone, barbiturates, and enzymes.⁴⁸ Estradiol is effectively absorbed sublingually for post-menopausal treatment.³⁸ Papain, given buccally, produces a modification of the inflammatory reaction and absorption of edema.⁹⁹

One must question the term "oral absorption" because in many of the studies it is not determined whether the substance is actually absorbed into the system, or if the effects of the administered substances occur because of gustatory nerve stimulation with the nervous system mediating the change in function without oral absorption. Some studies definitely document absorption into the bloodstream. G-strophanthin can be measured in the plasma from fifteen minutes to two hours after sublingual administration.³⁴

Another consideration that is not adequately understood from the literature is the speed of expected physiologic change from the administration of a substance. In most studies, the expected action was not tested for until two or more minutes after the

oral administration.

In any event, there is substantial data indicating physiologic change from what may or may not be oral absorption. Sometimes the effectiveness of the orally administered substance is greater than when the substance is administered by intramuscular or intravenous injection. Lorazepam (a surgical pre-medication) is more effective when administered sublingually than intramuscularly.⁴⁷

Several cardiac medications are administered sublingually. Cardiac muscle function changes within ten minutes of the sublingual administration of Molsidomine, as indicated by ECG.⁸² There is an improved absorption of tetranitrate (a medication for angina pectoris) sublingually as opposed to the buccal pouch. It is effective when administered buccally, by inunction, or injection; it is considerably less effective when swallowed.⁴

Much study has been done on the effectiveness of nitroglycerin when administered sublingually. The body initially reacts to the nitroglycerin at the first measurement of two minutes.³⁷ At that time there is a decrease in systolic pressure and an elevation in forearm blood flow.⁹⁷ The fall in systolic pressure is present in normal subjects performing steady exercise,⁶⁷ as well as in those needing treatment with nitroglycerin. The maximum decrease of heart rate in the seated position is between four and seven minutes after sublingual administration of nitroglycerin.²⁴

When there is lack of salivation, there is limited dissolution of the nitroglycerin tablet and delayed physiologic effects.¹²⁵ This may result from medications that have

anticholinergic side effects. It is clinically evident in applied kinesiology nutritional testing that patients who have limited saliva, whether because of medication, disturbed nerve control of salivation such as treated by applied kinesiology, or dehydration, are more difficult to test for needed or adverse chemical substances, such as nutrition and toxic products.

Data currently available seems to indicate that the most reasonable explanation for the change of muscle function, as perceived by manual muscle testing during AK nutritional testing, is stimulation of the oral nerve receptors. It is possible that some of the chewed material enters the bloodstream and then stimulates remote receptors of various kinds. If this is so, the substance must be absorbed rapidly because the change in muscle function occurs almost immediately.

The speed of absorption through the oral mucous membrane is indicated in a study by Miles and Dellow.⁹⁸ They devised a system in which the oral cavity of a rabbit could be isolated from the remaining gastrointestinal system and the nasal cavity. Tritiated (radioactive) water was recovered from the external jugular vein within twenty to forty seconds of the commencement of the oral profusion. Blood samples were taken at twenty-second intervals for 200 seconds. The recovery rate increased linearly up to 200 seconds. The investigators state, "Under normal circumstances the level of absorption can be assumed to be greater than the experimental because of the influences of muscular activity, blood flows, and increased areas of mucosal exposure."

Direct pathway to the brain. An intriguing area that requires further investigation is a direct pathway from the oropharynx to the brain, described by Kare⁸⁶ and Maller et al.⁹⁵ Isotopically labeled glucose and sodium chloride were introduced into the oropharyngeal cavity of a rat. The esophagus and trachea were ligated proximal to the submaxillary gland. The experimental rat was able to breathe through a slit in the trachea below the ligature. The labeled glucose and sodium chloride were left in the oropharynx four minutes, then the material was rinsed out with distilled water. The animal was then quick-frozen in liquid nitrogen. Radio tracer studies found the isotopically labeled glucose and sodium concentrated in the tissues of the face region, and clearly in the intracranial cavity and in the brain. None of the active material was found below the ligation, including blood samples taken from the heart. This indicates that there was no absorption into the bloodstream; therefore, it was not due to sublingual absorption. Kare⁸⁴ states, ". . . if the isotopes are introduced into the gut, they are not detectable in the brain but are demonstrable in the liver and blood." In some trials the isotope was applied to the oral cavity for less than thirty seconds, and detectable activity was found in the brain.⁸⁵ In addition to the studies of Kare^{84,85,86} and Maller et al.,⁹⁵ only one other study was found investigating the possibility of a direct pathway; it failed to confirm the earlier findings.¹²¹ Further investigation is needed to determine the possible influence of this type of pathway on applied kinesiology nutritional testing.

OLFACTORY RESPONSE

Stimulation of the olfactory receptors is part of the gustatory response. People with a cold often say, "I've lost my sense of taste," revealing the importance of olfactory function in taste. Much of what is perceived as taste is actually smell. Probably part of the applied kinesiology nutritional test when an individual chews a substance is also stimulating the olfactory receptors. There are also procedures to directly use the olfactory function in testing substances, as well as in administering certain types of nutrition and therapy²²; these will be discussed later.

The olfactory receptors are unique. It is estimated that there are 100,000,000 olfactory cells in the olfactory epithelium, interspersed between sustentacular cells.⁵⁵ The olfactory nerves are constantly replaced. They are the only nerve endings out in the open, protected only by a thin film of mucus.¹⁰⁰ The fibers from the olfactory cells pass to both the medial and lateral olfactory areas of the brain. This may be important in a holographic hypothesis of the gustatory system.

There are fewer studies of the effect of stimulating the olfactory receptors on physiology than for the oropharynx receptors. It is clear, however, that medication administered this way sometimes affects the body more dramatically than when injected. When Pitressin(R) is administered intranasally there is a transitory, sharp rise in blood pressure and associated pallor of the stomach mucosa. When Pitressin(R) is administered by hypodermic injection the effect is similar to nasal administration, but it is less marked.¹⁵⁶

Some of the effects of nasally administered medication may be derived from absorption through the mucous membrane and in the lungs. Calcitonin is used in the treatment of Paget's disease. It is absorbed by nasal spray with no side effects, producing an effective treatment.²⁸

When substances are tested by sniffing the vapor, the effect on the body as measured by manual muscle testing is immediate. Immediate action is also seen in the application of some drugs. Amyl nitrite, when inhaled immediately, causes a decline in arterial pressure.⁹⁷

The sense of smell varies with different disease states. Patients with adrenocortical insufficiency were asked to select by olfaction the one solution of three that differed from the others. Two bottles contained water and one contained a solution of salt, sucrose, urea, or HCl. When compared with normal volunteers, the patients with adrenocortical insufficiency had an increase in sensitivity up to 10^7 times. Treatment with steroids returned smell sensitivity to its normal range in each patient.⁶⁴ This increased sensitivity may be a factor in the self-selection of appropriate nutritional needs. It may also contribute to the sensitivity of applied kinesiology nutritional testing.

HUMAN FOOD SELECTION

The study of self-selection of food by humans is basically limited to young children who have not yet developed a learned response for food preference. In an early and follow-up classic study of fifteen children by Davis,^{26,27} there is strong evidence that self-selection -- if not interfered with -- provides the

proper foods for the body's needs.²⁷ The children were brought into the program -- which lasted six years -- as infants age six to eleven months at the time they were weaned. Prior to entering the study, they had not received any food other than milk from nursing. The children were brought into the study at this young age to eliminate any outside influence on their selection of food. All children were in the program for at least six months; all but two remained for one to four-and-one-half years.

The children were allowed to choose from a large selection of natural foods. Most of the food was cooked to avoid loss of soluble substances; no salt or seasoning was added. Some items were served both raw and cooked to allow a choice.

When the study began, four children were poorly nourished and underweight, and five had rickets. During the first weeks of the experiment, the children selected many types of food but finally narrowed their choices down to groups of likes and dislikes. Each child's diet varied from the others. There were no failures to regulate the diet by self-selection, and no influence from adults. Throughout the program, the children's health was excellent except for colds lasting approximately three days. There were no serious illnesses throughout the six-year period. At one time the entire group contracted acute Pfeiffer's glandular fever on the same day. During the convalescent period an unusually large amount of raw beef, carrots, and beets was eaten.

Two occasions indicate that the children selected the type of food needed by their bodies. One child with the highest gastric

pH chose a diet of much higher alkaline food than other children. Another child began the experiment with rickets. In addition to his food selection, his tray contained cod liver oil and milk containing cod liver oil. Throughout the period the disease was active, the child's food selection included the cod liver oil. About the time the blood calcium and phosphorus reached normal and x-rays showed the rickets had healed, the child ceased taking any pure cod liver oil.

It appears that the general calcification of bones in this group was above average. The roentgenologist who studied all the children wrote in his report to Davis, "The beautifully calcified bones in roentgenograms of your group of children stand out so well that I have no trouble in picking them out when seen at a distance." The excellent bone formation was present whether or not the child had rickets when he entered the study.

The children's dietary selection varied from time to time and did not follow any standard convictions. The unorthodox diets of orange juice and liver for breakfast and several eggs, bananas, and milk for supper was typical of the varying patterns. Can you imagine a mother of four children accepting individual requests of this type for meals?

The psychological evaluation of the children by an individual outside the study states, "I saw them on a number of occasions and they were the finest group of specimens from the physical and behavioral standpoint that I have ever seen in children of that age."

Almost all children five years of age like the taste of cod liver oil. As they grow older they develop a dislike for it. In a

group of 5-year-old children, nearly 100% liked cod liver oil; in a 14-year-old group, only 30% liked it. Some of the 14-year-olds had an almost insatiable appetite for cod liver oil. When allowed to satisfy their craving, they took as much as 16 tablespoons in one day and continued to do so for five to ten days. After that time, they desired only a small amount, finally stating that they no longer liked it. The children's desire for the cod liver oil correlates with rats deficient in vitamin A or D self-selecting cod liver oil until the deficiency was satisfied.¹²³

Adults do appear to recognize food that is needed when deficiencies are present. During World War II American soldiers in a German prison camp were given well below the minimum amount of food to sustain life. A high point was the arrival of Red Cross food parcels. Points were assigned to each type of food for trading purposes among the soldiers. The highest listed item was a can of powdered milk. The reason given for its popularity was that ". . . it satisfied -- even more than the chocolate -- the prisoners' craving for something rich to eat." This is especially significant since powdered milk was so unpopular among American soldiers outside the prison camps.⁹²

Unfortunately, most humans do not have the ability to make proper self-selection for their nutritional needs. In addition, it is impractical to eat whenever one wants to and almost impossible to have available whatever is desired.

LEARNED RESPONSE OF HUMANS

There are many factors that influence the type of food eaten by man. The unhealthy diet of most hypoglycemics may have started

with the innocent remark of a parent, "Be good at Uncle John's and I'll get you an ice cream cone." When adverse foods are used as rewards for a young child, it is only reasonable for him to develop a strong desire for such items. The food customs with which a child grows up will influence his food choice in adulthood. Richter¹²³ helps put this into perspective: "Most children are brought up by their parents to distrust their own appetites. Often when they like a food they are told not to eat it, and when they dislike it they are equally often told that it is nourishing and good for them. In later life such persons are much more apt to depend on food fadists than on their own taste sensations."

In some countries various foods have prestige or status value, causing certain individuals to avoid more wholesome foods for those with less value but providing an emotional satisfaction. Orientals prefer white polished rice. It has a status level much higher than the "dirty" rice pounded by the native women with primitive utensils. The white polished rice is far inferior to the whole rice; it contains no vitamin B₁ to protect the population against beriberi. "In China, for instance, there is a pronounced preference for white polished rice, and the man who eats brown, so-called dirty rice loses considerable face."¹⁴³ Only the Chinese overseers who could afford the nutritionally inferior white rice suffered from beriberi. Snapper¹⁴³ goes on to state, "Aborigines complete their qualitatively insufficient food intake by consuming insects, reptiles, and small game living in the jungle forest. Their

health status is immediately endangered if they are persuaded to abandon their original way of living."

Advertising techniques used by food processors may lead to erroneous nutritional concepts and a completely unbalanced diet. Sugar products have long been advertised as "quick energy" food. No wonder a weak, shaky hypoglycemic automatically reaches for another candy bar or soda pop.

The appearance and odor of food and the surroundings in which it is served contribute to the appeal or rejection of the food. The presentation of the food itself may be highly desirable, but if there are strong adverse odors in a dirty room, most people will find that their appetite diminishes. When the visual appearance of food is disturbed by unappealing mixtures of otherwise desirable food, it is less likely to be accepted. Sometimes the environment and appearance of food is such that it may disturb some people to the point of regurgitation.⁹⁷

Again we can learn from animals how difficult it is to change a learned response. As a physician you face this difficulty every time you prescribe dietary changes. The learned response is so strong that an animal will maintain an improper diet to the point of death when a lifesaving diet is present. If a rat develops a sugar preference before an adrenalectomy, it will maintain that diet after surgery, avoiding the choice of the sodium chloride solution that would preserve its health. On the other hand, if the choice of sugar or sodium chloride solutions is not given until after the adrenalectomy, the rat will choose the sodium chloride solution and survive with no weight loss.⁴⁸

Food selection in man is made by education through

advertising, parental guidance, prestige, and status. The Western way of life has limited instinctive, correct choice.

IMPORTANCE OF CHEWING FOOD

It is obvious from the earlier discussion that secretion of enzymes and other digestive products results from food stimulating the gustatory receptors. There are numerous isolated case studies reported in the literature that indicate chewing and stimulation of the gustatory receptors are important first steps in digestion. Wolf and Wolff¹⁵⁶ report on a nine-year-old individual who drank extremely hot soup, causing an esophageal stricture. Efforts to regain esophageal patency were futile, and a gastrostomy was performed. For six years the patient was fed directly into the stoma. He then began feeding himself, and developed a method of chewing the food before putting it into his stomach. It was not until then that he really began to gain weight and become robust. When food was introduced directly into his stomach, it failed to satisfy his appetite. Wolf and Wolff did extensive study of this individual when he was fifty-seven years old. They observed his stomach function through the stoma during different stages of emotions, dietary influence, medication, and other factors. It is an interesting and unusual study.

Hollander et al.⁶⁸ report on an eighteen-year-old man with a completely obstructed esophagus. A jejunostomy was done for feeding. His weight dropped to a low of seventy pounds. The young man wanted to chew food, even though it would soon be regurgitated from his esophageal sac. Using this procedure, he

reached a high of 114 pounds after six months. Later, after esophageal reconstructive surgery was done, he reached a high weight of 120 pounds.

Nicolaidis¹⁰⁹ reports studies in which rats suffered as a result of lack of oral food stimulation. When there was a suppression of oral feeding supplemented with IV continuous nutritional infusion, there was loss of body weight. When there was complete IV feeding, there was a greater weight loss; however, when a minute amount of powdered food was given to the rat, there was a beneficial effect on body weight. It is interesting to note that when saccharin was used for oral stimulation, body weight increased, but it did not continue like the minimum powdered food. This seems to indicate that the powdered food provides a complex, multifactorial stimulation to the olfactory, gustatory, and gastrointestinal receptors.

Rats deprived of food for four days were divided into control and experimental groups. The experimental group was provided with food. Within the first twenty minutes following ingestion of the food, there were only three instances of urination among the experimental group; there were twenty-six instances among the control group (n13). The rapidity of the response raises the possibility of signaling factors separate from postingestinal influences. The experimenters conclude, "This effect, which appears at maximum strength almost immediately after the introduction of food, cannot be adequately accounted for either in terms of postingestinal absorption of the food or on the basis of the dehydrating properties of food in the stomach." They go on

to state, "It would appear that the introduction of food into the mouth or stomach or both may provide sensory information that makes it possible for the organism to prepare for the forthcoming absorption."⁸³

NEUROLOGIC ASPECTS OF GUSTATORY CONTROL

Gustatory control as discussed here relates to the interplay between stimulation to gustatory receptors, remote chemoreceptors, liporeceptors, glucoreceptors, osmoreceptors, stretch receptors, and baroreceptors, among others. Little is known about the afferent pathways and interpretation of these impulses for the final efferent impulses to control the action the body will take. The influence of learned response will mediate the activity, as will nutritional deficiencies and other bodily needs. The control of food and water intake involves many peripheral and central systems.¹⁴⁴ There are many levels of mediation within the systems. We will consider the sensitivity of the gustatory receptors, the numerous nerves that transmit gustatory impulses, and some central mechanisms. Can this function that is so widespread be explained by holographic comparison of the transmitted nerve wavelengths from the body's remote environment, with the wavelengths of the taste sensation of the gustatory mechanism? Is there a match of wavelengths to an innately known and needed body chemistry?

Gustatory receptors. It is obvious that stimulation of the gustatory receptors has a widespread influence on the nervous system. All the ramifications are yet to be discovered. In general, it is considered that taste originates from stimulation

of the taste buds in the oral cavity, but even this understanding may be limited. Henkin⁶⁶ discusses studies in which ethanol or bile salts are injected intravenously into the arms of subjects. After seven to twelve seconds the odor is smelled, and within ten to fourteen seconds it is tasted.

The first consideration of neurologic aspects of gustatory control is the specificity and sensitivity of taste receptors. Are the taste buds sensitive to only one of the four primary tastes? Do the taste buds always have the same sensitivity to a specific type of stimulation? Halpern⁵⁶ discusses numerous experiments indicating neurophysiological, pharmacological, anatomical, and behavioral control of gustatory afferent responses. Following is a summary of some of the studies Halpern cites in his convincing presentation entitled "Some Relationships Between Electrophysiology and Behavior in Taste." In most cases the altered gustatory apparatus tends to contribute to normal homeostatic conditions.

A shift in balance of the autonomic nervous system changes the sensitivity of the gustatory receptors. General enhancement of gustatory responses is mediated through the sympathetic nervous system. Sympathetic stimulation increases the firing rate and number of units recorded in the glossopharyngeal nerve when the tongue is stimulated in a frog preparation.⁵⁶ A change in balance of the neurotransmitters may cause an individual to react differently to an applied kinesiology nutritional test from time to time. There is evidence that the contents of the digestive system will influence the sensitivity of the gustatory receptors.

There is rapid modification of taste receptor sensitivity

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synergistic muscles or otherwise change the test parameters.

Continued research is necessary to put into perspective the applied kinesiology evaluation of nutritional effects on body function. It is important to reiterate that the results from AK testing must be correlated with all other standard procedures for determining the patient's needs for nutritional supplementation. AK testing adds a functional dimension to the final prescription.

SUMMARY

It is evident that stimulation of the gustatory receptors causes widespread neurologic activity in the body. When applied kinesiology nutritional testing is correlated with the standard methods of determining a patient's nutritional needs, it appears to be a viable approach. The full discipline of applied kinesiology testing and nutritional diagnosis must be correlated.

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The tablet tested first was on a random basis. The placebo effect was definitely operative in this test; however, vitamin A outperformed the placebo in strengthening the pectoralis major (sternal division) by six to one. An interesting aspect of the study is that the placebo effect was more operative when the placebo was the first tablet tested.

It is difficult to design an effective study to evaluate applied kinesiology nutritional testing. Foremost, the designer must be familiar with all aspects of applied kinesiology. A major effort is required to eliminate as many variables as possible. A study by Friedman and Weisberg⁴⁵ is an example of a poorly-designed study that does not adhere to proper muscle testing principles. Possibly the most important factor in obtaining accurate test results is the examiner's knowledge of ways the subject may change the test parameters to appear strong in the presence of weakness. Subjects will often shift body position, change direction of force, and otherwise modify the test to recruit synergistic muscles. These factors must be observed by the examiner so they can be placed into the equation that finally evaluates whether there is muscle strength or weakness on manual muscle testing. The study by Friedman and Weisberg was designed to evaluate dental vertical dimension, Golgi tendon organ manipulation, and the effect of chewing sugar. In order to make the examiner blind, the subject was placed behind a screen with his arm held out so that the examiner on the other side of the screen could contact the subject's wrist for an arm pull-down type of test. This gives the examiner no ability to control the patient's body shift when he makes an effort to recruit

have sugar handling stress more frequently weaken when sugar is placed in the mouth than does the random population. The significantly positive outcome of this study may relate with the population study of students under stress. The second interesting factor is the difference between the manual muscle test results and the muscle test results against a mechanical transducer. The failure to correlate with the manual muscle test is supported by Blaich's¹⁶ and Blaich and Mendenhall's¹⁷ studies in comparing the manual muscle test with Cybex II testing.

Scopp¹³⁶ evaluated the nutrition-muscle association described in applied kinesiology by giving individuals with unilaterally weak muscles either a placebo or the indicated nutrient. Muscle strength was measured by a JayMar dynamometer, with a 21% gain in strength for the nutrient group. This was statistically significant ($p < .05$) as compared with the placebo group. The placebo group showed a small non-significant pre/post decrease in muscle strength. The muscles were tested according to methods described by Kendall and Kendall.⁸⁸

In a double-blind study, Sandweiss¹³¹ tested the pectoralis major (sternal division) muscle on twenty-nine individuals with a normal manual muscle test in the clear, and another group of twenty-six individuals with a pectoralis major (sternal division) muscle that was weak in the clear. The individuals were tested with vitamin A and a placebo. The placebo was manufactured by the same company as the vitamin, so that the taste and appearance of the tablets would be similar. The tablets were administered so that neither the subject nor tester knew which was being tested.

muscle test. From each study something has been learned, ranging from the value of the AK procedures to how to design improved studies.

Rybeck and Swenson¹³⁰ evaluated the effect of chewing sugar on the latissimus dorsi muscle, which is associated with the pancreas in applied kinesiology. The population of the study was seventy-three healthy students who were unfamiliar with applied kinesiology. In random questioning, as many believed that sugar might increase strength as decrease it; most had no opinion. The subjects were first evaluated for a normally functioning latissimus dorsi with manual muscle testing. Only those judged to have solid muscle function were used in the study. Two types of muscle tests were performed: (1) the standard manual muscle test used in applied kinesiology, and (2) one against a force transducer.⁷¹ The tester was blind as to whether the subject received a sugar cube or nothing as a control. The hypothesis being tested was whether sugar in the mouth would cause the latissimus dorsi to weaken. The results were insignificant for the mechanical test. For the manual muscle test there was a significant difference between the control and experimental groups. The Wilcoxin Rank Sum Test showed the experimental group to be significantly different from the controlled one ($p=0.0062$).

There are two interesting factors about this study. First, it is not expected that everyone will weaken when sugar is placed in the mouth. As noted previously, depending on the physiologic needs of the body at the time of the test, it is expected that some individuals will strengthen when sugar is placed in the mouth. On a clinical basis it is observed that individuals who

candida albicans.^{102,148}

Medication can often cause a confusing pattern as observed by applied kinesiology examination. Some of the medications causing the greatest problems are tranquilizers, mood elevators, birth control pills, and diuretics. When the symptomatic pattern and other aspects of physical examination are not correlating with applied kinesiology tests, it may be due to medication the patient is taking. Often chewing ribonucleic acid will change the results of manual muscle testing so that all aspects of the examination correlate.

RESEARCH IN NUTRITION TESTING

Much more research is needed before there will be a thorough understanding of the relationship between chewing nutrition and the performance of a muscle when tested manually. One of the major problems in designing a research study is the number of factors that influence the manual muscle test, such as the cranial-sacral primary respiratory system, reflexes, subluxations, and many others. As Goodheart⁵¹ points out, ". . . the nutritional factor is only one component of the composite whole of the particular problem posed by the particular patient." The study by Leaf,⁹¹ previously discussed, dramatically shows that there is no one nutritional factor that correlates with a specific muscle; the patient's general health level influences the number and kind of nutrition that will change muscle function. Each individual or group who has done a study is to be congratulated. There have been negative and positive studies indicating that chewing nutrition has an effect on the manual

is no improvement, have the patient chew another tablet and re-test. Continue this procedure until definite improvement is observed, or numerous tablets have been chewed without improvement. The number of tablets needed for therapy is somewhat indicated by the number chewed to obtain results. The most important factor is to re-check the patient's balancing time on subsequent visits, regulating the number of tablets accordingly.

Occasionally a patient's orientation in space will be worse after chewing the RNA. When this happens, have the patient chew an extremely small amount of the substance, similar to a homeopathic dosage. Some people are very sensitive to this substance when chewed. In this case, very small and frequent dosage will usually re-establish normal orientation in space.

Of course, it is necessary to rule out any central nervous system disease.⁶² In addition, disturbance of the equilibrium proprioceptors from cranial faults or an upper cervical subluxation or fixation can cause poor orientation in space.

Ribonucleic acid may be of value in testing a patient. Sometimes there are obvious health problems although manual muscle testing does not reveal any dysfunction in the nervous system. The body remembers everything that has ever happened to it. Although the record is present at all times, it cannot always be drawn out at will. To help uncover hidden problems, have the patient chew RNA. RNA appears to enhance the memory pattern, and dysfunction that was previously not apparent appears as indicated by manual muscle testing. Often RNA is supplied in a yeast form. Be certain that the patient is not sensitive to yeast, as in

ate Group A appeared to have a chemical memory transfer from that group. A significant number of them went to the feeding site when the electrical shock and light were turned on. The naive group (BB) that ate Group B showed no effects from the electrical stimulation and light. Another study⁶¹ indicates that planaria that cannibalized either trained or untrained planaria did better than naive planaria that did not cannibalize other planaria. This indicates that something in the cannibalistic process is involved in these findings.

In a blind, controlled study by Babich et al.,⁸ rats were trained to approach a food cup when a distinct click was sounded. Ribonucleic acid was extracted from the brains of these rats and injected into untrained rats. Without any training, the injected rats manifested significant tendencies to approach the food cup when the click was sounded.

It is obvious that much is to be learned about the memory process. The exact role of RNA in memory is unclear, but it has been associated with function change in applied kinesiology testing in such a way that it appears to relate with memory.

It is not unusual for a patient to have difficulty passing the Romberg test, yet no spinal cord posterior column disease is present. Goodheart⁵² postulates that short-term memory is required to maintain orientation in space with the eyes closed. To determine if RNA improves orientation in space, have the patient stand on one foot with his eyes closed. Note the ability to maintain this position, and possibly record the time the patient can stand on one leg without veering to the side. Have the patient chew an RNA tablet and repeat the process. If there

result." In-depth testing with applied kinesiology seems to indicate that memory is located throughout the body. Researchers tend to think in terms of their own pet theories to the exclusion of all others. It seems that there are many types of memory, perhaps used for different purposes in the various functions that are necessary for preservation of the species.

Chemical memory is one type that has been proposed, and primarily associated with it is ribonucleic acid (RNA). The RNA molecule is an extremely large one, consisting of a string of hundreds or even thousands of sub-units of four different kinds. It has been proposed that new information entering the nervous system introduces a change in an RNA molecule of specific neurons reserved for the purpose. This unique protein is a memory of the occurrence. New information is compared with the established RNA/protein combination already present. If the match succeeds, memory is recognized.⁷ Studies have been done in which rats or worms were trained, then an attempt was made to chemically transfer the memory of the training to naive subjects.

Both the chemical and neurologic natures of memory are demonstrated in a unique planarian experiment at the University of Michigan.²⁵ The worms were split into two groups for feeding. Group A was trained to associate an electrical shock and light with feeding time; Group B received the electrical shock and light at random times, not with feeding. Group A developed a conditioned response to go to the feeding place. During one stage of their existence, planarian earthworms are cannibalistic. Groups A and B were fed to two naive groups. The group (AA) that

sensitivity to stimulation. No studies of this have been found.

Dehydrated patients may not show effective therapy localization. When dehydration is present, positive therapy localization may be present after the patient wets his fingertips when it was not present before.

Sometimes a patient's general dehydration will cause nearly all muscles to test weak. When this occurs, the patient will often regain normal function in some or most of the muscles after drinking a glass of water. The effect is immediate, without adequate time for water absorption into the system. Human studies were done to determine the amount of perspiration in dehydrated subjects when water or saline solution was administered orally.¹⁰⁸ In the dehydrated subjects, there was an initial discharge of sweat 2.7 seconds after beginning to drink. In rehydrated subjects, the same sweating response was not observed. The minimum time required for sweating to begin in the dehydrated subjects suggests a reflex within an orogastric origin. When there is poor therapy localization because of dehydration, the patient may not need to wet the fingertips if a glass of water is drunk.

Ribonucleic acid. Research into where and how memory is stored has produced many hypotheses and theories. Pietsch¹²⁰ summarizes this nicely: "Name the molecule, cell, or lobe, or stipulate the physiological, chemical, or physical mechanism, and somebody, someplace, has found memory on, in, around, or associated with it and, in spite of the generally good to splendid quality of such research, there is probably someone else, somewhere, whose experiments categorically deny a given

gland that processes ribonucleic acid, codes the RNA released from dead cells by antigen-antibody reaction as a result of tissue degeneration. After this coding, the RNA is secreted by the parotid gland during the chewing process. The coded RNA from the saliva combines with the food, tagging it for specialized use in the body. This provides a selective use of the available nutrition to regenerate the areas of degeneration.

This hypothesis resulted from the observation that when thymus nutritional support was tested, it would not influence any muscle other than that associated with the thymus gland (infraspinatus). Parotid glandular substance likewise caused no major change. When thymus and parotid substances were placed in the mouth together, weak muscles associated with the endocrine system strengthened. Use of nutrition for specialized areas, such as the adrenal, ovaries, etc., was enhanced when thymus and parotid substances were administered with a specialized tissue. This activation and correlation of nutritional products in the chewing mechanism seems reasonable because of the necessity of chewing nutritional products to obtain optimal benefit.

Dehydration. Many individuals are dehydrated. This may interfere with adequate nutritional testing. As previously indicated, nitroglycerin is less effective for the treatment of angina pectoris when the mouth is dehydrated, primarily because the nitroglycerin fails to dissolve and be absorbed.¹²⁵ In nutritional testing there is lack of response in the presence of dehydration, even if the tablet is chewed, perhaps because mixing saliva with food for processing changes the gustatory receptors'

potassium is retained in the body. Under these circumstances, having the patient chew or suck on a potassium tablet or consume some of the fruit may cause general indicator muscles of the body to weaken -- evidence to reduce the fruit in the diet.

Nutrition dosage and administration. There is no satisfactory method for determining dosage requirements with applied kinesiology. The best method to date is to determine initial dosage empirically, then adjust it according to the amount needed to maintain normal function of the associated muscle.

There is considerable evidence that it is important to chew nutritional supplements to stimulate the gustatory receptors, alerting the body to the type of food it is receiving. This activates the enzyme system and other processes necessary to properly use the nutritional product. Swallowing a tablet is similar to putting food into the stomach through a stoma.

Certain nutritional products are more effective when administered throughout the day. In severe conditions, one may have a patient chew a low-potency product every fifteen minutes for the first day or two. In some cases, it appears that the stimulation of the gustatory receptors is more important than the quantity of nutrition taken. Equally effective treatment may be obtained by cutting the tablets into quarters so that the patient chews a quarter of a tablet every fifteen minutes.

Parotid and thymus role. Until recently the thymus gland was very much overlooked in the adult. Its role in the autoimmune system is being recognized, but that subject is outside the scope of this text.

Goodheart⁵³ proposed that the thymus, being an autoimmune

so. Vitamin C labeled as "natural" from rose hips can contain some rose hips, but it may be brought up to the label dosage with ascorbic acid.

Megavitamin dosages can sometimes create side effects by depleting the body of the co-factors necessary to process the high dosage of the administered nutritional product. Megavitamin dosages are often of value in treating specific conditions. One should take care that the megavitamin dosage is not creating imbalance within the body, ultimately causing a new problem.

Some nutritional products are processed to maintain the product in as natural a state as possible. These products are usually low in dosage, and an attempt is made to maintain the natural synergistic factors as nature developed them. Use of this type of nutritional supplementation is a true nutritional approach, rather than an allopathic one. Many of these products can be used on a continuing basis without concern for creating an imbalance within the body.

Sometimes nutritional products will cause a previously strong indicator muscle to weaken, indicating that some factor is detrimental to body function. There are many constituents of various nutritional products that can cause this to happen. A patient may be sensitive to artificial coloring, the carrier, or to the nutrition itself. An example of a patient being sensitive to an item is when too much of a substance is provided in the patient's diet. Sometimes patients who are hypoglycemic and hypoadrenic are given a diet high in whole fruit and fruit juices, which provide considerable potassium. In the hypoadrenic,

seventeen to twenty responses showed strengthening of the muscle as follows: niacinamide (28%), vitamin E (22%), inositol (24%), and thyroid extract (100%). When there were thirteen to sixteen positive responses on the questionnaire, muscles strengthened to niacinamide (13%), vitamin E (15%), inositol (11%), and thyroid extract (91%). There was no response in 1%. The patients marking four to twelve symptoms proved most positive in selectively strengthening the teres minor muscle by thyroid extract. Results were as follows: niacinamide (3%), vitamin E (5%), inositol (4%), and thyroid (92%). There was no response in 3%. When there were three or less positive responses on the questionnaire, there was random response of the teres minor strengthening, similar to when the nutrition was placed on the skin. This study indicates a selectivity of chewed nutrition affecting an apparently associated muscle. When there is a very high symptomatic pattern relating to the muscle-gland association, more types of nutrition strengthen the muscle than the expected individual association. When there is a lower number of positive responses on the symptom questionnaire, the expected nutrition-muscle-gland association shows a higher percentage.

Allopathic or nutritional? There are two approaches in the use of nutrition. The megavitamin approach, advocated by many, is basically an allopathic approach to nutrition; that is, a nutritional product is given to create a specific response in the body, frequently to counteract some health problem or potential health problem. Often the nutrition used in megavitamin dosages must be synthetic to obtain the high dosage level. The labeling of nutrition as "natural" does not necessarily mean it is 100%

localization, indicating the substance is appropriate for the thyroid. If the positive therapy localization is not abolished, have the patient place his other hand on another gland or organ reflex point, such as the adrenals, while continuing to therapy localize the thyroid. Re-test the indicator muscle; if there is no change, continue with other organs or glands until one is found that neutralizes the positive thyroid therapy localization. If therapy localizing the spleen cancels the positive therapy localization, there is indication that the spleen is also involved. Have the patient chew spleen substance or vitamin C and re-test the thyroid reflex area with single-handed therapy localization. There will be no positive therapy localization to it if the spleen substance helped the problem.

The interaction of nutritional support is indicated in a study by Leaf.⁹¹ The study was done to determine the effect on a weak teres minor muscle of putting nutritional substances on the skin or in the mouth. Subjects participating in the study answered a survey form containing thirty symptoms relating with either hypo- or hyperthyroidism. Four nutritional substances -- niacinamide, vitamin E, inositol, and thyroid extract -- were placed on the skin, and the teres minor muscle was tested for strengthening. The substances were then put in the mouth, and the teres minor was again tested for strengthening. Placement of the nutrition on the skin produced a random response. When the nutrition was put in the mouth, individuals who marked over twenty symptoms on the survey showed strengthening of the teres minor muscle with all four nutrients. Individuals who marked

If it is appropriate therapy, a weak associated muscle will strengthen. For example, if the infraspinatus muscle -- associated with the thymus -- strengthens upon inhalation of the vapors of echinacea, an herb that supports the immune system, there is evidence it will be of value in the immune-deficient patient. Harmful substances are tested by sniffing and testing a strong muscle for weakening.

A therapeutic substance can be given to a patient over a protracted time by inhalation absorption. The method of application is usually by a vaporizer. Approximately one dropper of the substance can be put in two quarts of water to vaporize in the bedroom while the patient sleeps.

Interaction. There is considerable nutritional interaction within the body. For example, a patient may have hypothyroidism, but the usual nutritional products that improve the condition are ineffective. Applied kinesiology testing methods may provide information about an interaction causing the endocrine system to malfunction. Another gland may be involved with the hypothyroidism. If it is nutritionally supported, the hypothyroidism may improve. The examination for interaction is done with double-handed therapy localization. Prior to testing for interaction, determine if direct nutritional therapy to the gland in question is applicable. In the case of hypothyroidism, have the patient place his hand on a thyroid reflex area, such as the neurolymphatic reflex, and test a strong indicator muscle for weakening. If it weakens, have the patient chew thyroid substance and/or iodine. Re-therapy localize and test the indicator muscle. In many cases, this will neutralize the positive therapy

because of the body's physiologic needs at the time. Certain patterns are frequently -- but not always -- present. Chemicals toxic to the body, such as carbon tetrachloride, will especially weaken the pectoralis major (sternal division). Alcohol will often weaken the sartorius and gracilis muscles in an individual with relative hypoadrenia. Although there are many such patterns, 100% applicability to all individuals is rarely present. If one consistently obtains the expected results from muscle testing to evaluate nutrition and other compounds, he should evaluate the quality of his muscle testing. Unexpected results are good evidence of quality muscle testing.

Olfactory stimulation. Therapeutic products, such as vitamins, herbs, homeopathic preparations, and Bach flower remedies, can be tested for need and administered therapeutically by inhalation. Brimhall²² introduced this concept to applied kinesiology in 1979, and it has been a useful procedure under many conditions.

Absorption of heavy toxic metals by respiration is commonly recognized.¹³⁴ There has been a major effort to reduce lead from automobile emissions because of absorption into the body by respiration. Great care must be taken in a dental office to prevent mercury from going into the vapor state because of its high absorption into the system by inhalation.

Testing therapeutic and harmful products for applicability to a patient's condition via inhalation is very similar to chewing the substance. Simply hold a container of the product to be evaluated under the patient's nose and have him sniff the odor.

stimulate the gustatory receptors. Chewing the substance is the most effective means of testing because it simulates the oral movements of eating. There is an increased response from the oral chemoreceptors if the papillae are moved in conjunction with the substance tested.¹⁴

The substance chosen to test in various health conditions is determined by the examiner's general knowledge of nutrition. Substances found to frequently improve function of various muscles are listed in the muscle testing chapter of this text. The list is not all-inclusive, nor does it indicate that the substance will actually improve muscle function in all circumstances.

Adverse compounds. Adverse effects of compounds on the body can be determined in a manner similar to that for nutritional needs. If a food product, nutritional item, or environmental chemical is detrimental to the body, it will cause associated muscles to weaken. In some adverse cases, all muscles of the body will temporarily test weak after administration of the detrimental substance. Again, it is best to test an associated muscle. For example, many items are detoxified by the liver. The pectoralis major (sternal division) is an excellent muscle to test for weakening caused by detrimental substances.

Some have said that the administration of refined sugar will weaken anyone. This is not correct, and if one consistently finds it to happen, he should re-evaluate the quality of his muscle testing and mind-set.¹³⁵ Truly healthy individuals usually do not weaken with the ingestion of refined sugar. In some cases, refined sugar will make a previously weak muscle test strong

APPLIED KINESIOLOGY NUTRITIONAL TESTING

As previously discussed, applied kinesiology nutritional testing should always be correlated with standard clinical and laboratory methods of determining nutritional deficiencies to make a final determination of a patient's needs. In general, testing a patient for nutritional needs is simple; however, a specific protocol should be followed. The most frequently abused portion of the protocol is accurate muscle testing. First, the test should be of a specific muscle, isolating it to the maximum so there is little opportunity for recruitment of synergistic muscles. Since the muscle testing is done before and after administration of the tested substance, one must be very careful to reproduce the test in exactly the same manner.

The procedure for testing a patient's response to nutrition is to have him chew or suck on the substance until the gustatory receptors are stimulated. A muscle is then tested for change. A weak muscle may become strong, or a previously strong muscle may test weak.

When attempting to find the proper nutrition to support an organ or gland, it is best to test the muscle(s) associated with that organ or gland. If a patient is diagnosed as having a liver disturbance and the associated pectoralis major (sternal division) muscle tests weak, have the patient chew a substance that may help the liver, such as vitamin A. If the weak muscle is associated with the liver disturbance and the vitamin A is appropriate treatment, the muscle will test strong. The vitamin A is placed in the patient's mouth, and he chews or sucks on it to

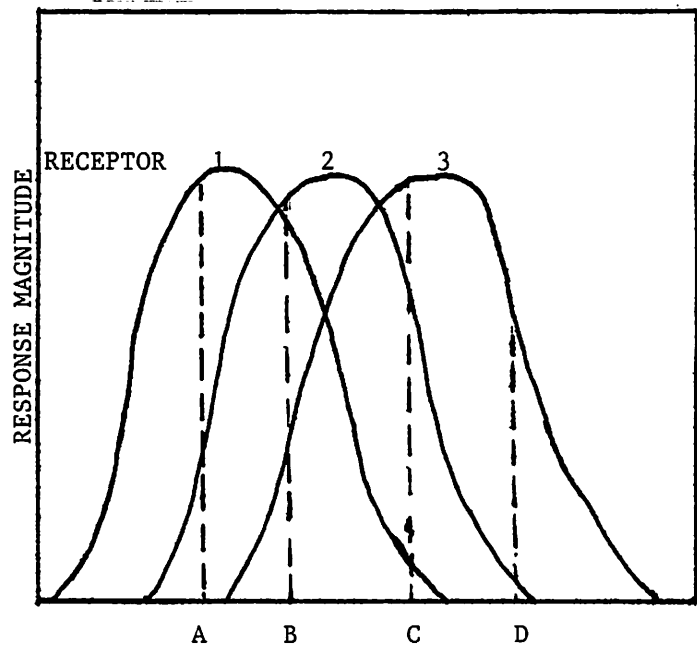
increase in brain responses, and often the basal activity was progressively inhibited. A surprising finding was a more ventrally located area to the prosencephalic fasciculus where the response was exactly opposite that described for the supraoptic nucleus. It seems possible that these centers in the brain are the recording area for the object and reference beams of holographic neurologic function, with the impulses reporting concentrations in the blood being one beam and the stimulation to the gustatory receptor impulses the other.

There are numerous areas in which there are antagonistic centers in the brain. For example, the appetite centers located in the hypothalamus are the lateral nucleus for "hunger or feeding," and the ventral medial nucleus is the "satiety center." These areas may be the reference and object beams of holographic function. The analogy of taste with color vision by Erickson^{35,36} was made prior to the current holographic model of the nervous system; however, it fits well into this pattern.⁵⁵ Dolgoff³¹ reports that von Bekesy of the University of Hawaii has shown that the mathematical impulses of the holographic theory applied to the neuroreactions to stimuli in the gustatory system. Presently the exact neurologic mechanisms responsible for the clinical observation of applied kinesiology nutritional testing are unclear; however, there is ample evidence of a widespread neurologic function throughout the body from stimulation to the gustatory receptors. There is also considerable evidence that integration of remote receptors and those of the gustatory system is important in maintaining the body's homeostasis.

hypothesis ". . . that the the hypothalamus, far from integrating and interpreting all of the complex regulatory influences that appear to act on the nutritive process, may, in effect, serve primarily as the sensory end organ of a much more complex system which involves much, if not all, of the old cortex and related subcortical relay stations." Yamamoto¹⁶⁰ states, "In comparison to the relatively simple and stereotyped reflexes mediated in the brainstem, more complicated or well-organized responses relating to motivational, effective, reinforcing, arousal, and ingestive behaviors are involved in taste functions of the limbic and hypothalamic areas." He continues, "Neurons in the parabrachial nuclei project to the cortical taste area via the thalamic taste relay nucleus. This thalamocortical pathway may be concerned with taste discriminatory function." "Taste input projects to different locations in the rat cortex. Direct thalamocortical inputs are received at the ventral taste area and are important in taste discrimination. The second area may receive direct thalamocortical input, but its functional importance is still vague."¹⁵⁹

To help understand some of the rapid homeostatic adjustments made by the body, Nicolaidis¹⁰⁸ recorded two areas of the cat's brain -- at the supraoptic nucleus, and above it in the central zone of the medial prosencephalic fasciculus. When an intercarotid injection of NaCl was given, response in the brain was almost immediate. Buccal stimulation with NaCl solution produced a similar activation in the brain. The application of the NaCl solution to the tongue caused a reduction in urinary flow. Bathing the buccal area with water did not produce the

Can the combination of different types of fibers and impulses account for the many tastes as they do for varied color sensations received? Assume that there are only three receptor-fiber types to perceive color. Now suppose that four colors are individually used as stimuli and recordings are obtained from the three receptor-fiber types. The receptor-fiber types are indicated by 1, 2, and 3 on the accompanying graph. The color stimuli are indicated by A, B, C, and D. When the stimulus is from color A, the receptor-fiber types are stimulated to different degrees or not at all. The summation of activity is at the ordinance of A with the receptor type. The same is true for colors B, C, and D.



Central control. There is widespread distribution of taste impulses in the brain. The central system is focused in the hypothalamus, limbic lobe, and midbrain. Certain areas have been designated for specific function. For example, the lateral hypothalamus has been regarded as the "center" for feeding and drinking.¹⁴⁴ Regardless of these designations, it seems obvious that the integration of efferent and afferent activity of the gustatory system is widespread. Grossman⁵⁴ proposes the

determine if the pattern was similar for substances with similar taste. This portion of the hypothesis was substantiated. It is further supported by Zotterman,¹⁶¹ who found that different biological sugars stimulating the gustatory receptors produced different responses in the recording of the chorda tympani nerve. Erickson³⁵ correlated this physiologic information with behavioral tests of the rats based on shock-based avoidance of drinking from one salt to others. He concluded that ". . . the neural message for gustatory quality is a pattern made up of the amount of neural activity across many neural elements."

Individual fiber recording at the chorda tympani nerve indicates very similar nerve transmission from stimulating the gustatory receptors with lithium chloride or sodium chloride,⁴⁰ yet the rat learns to avoid toxic lithium chloride.¹⁰⁴ Since an animal's behavior pattern varies with different taste receptor stimulation and there is little or no difference in the nerve impulse as recorded at the chorda tympani nerve, there must be some method of higher taste discrimination. Zotterman¹⁶¹ puts electronic nerve recording into perspective when he says, "It is not known whether the central nervous system 'sees' the responses from the chorda tympani in the same way as the electronic apparatus."

Coding of taste is an integration of the responses of the population of gustatory neurons, rather than an activity in particular neuron types related to the four basic tastes. Stimulus intensity is coded by the total amount of activity elicited in a population of responding neurons.¹⁵⁵ Erickson^{35,36} analyzed the function of the much better understood color vision.

lesions in the nervous system by testing for lack of taste. Microelectrode recording from individual taste receptor cells shows no, all, or nothing spikes characteristic of neural tissue. Different size spikes are seen in recording strands of the chorda tympani nerve when there is stimulation to the gustatory receptors. The recorded potentials appear to be graded responses to the taste stimuli. Each receptor cell responds to a number of taste stimuli. Discrimination of the basic taste qualities of sweet, sour, salty, and bitter is not receptor-specific. Yamamoto et al.¹⁵⁸ classified four types of cranial nerve XII response to stimulation of the tongue in lightly anesthetized, non-decerebrate and acute decerebrate rats. Two distinctive groups developed -- a sucrose-sodium (NaCl) group and a hydrochloric (HCl)-quinine one. In addition, there are extraneous factors that influence the afferent impulse from the receptor. Patton¹¹⁴ states, "The complex sensations aroused by mixed gustatory stimuli are a fusion of the four primary modalities along with various somatosensory and olfactory components."

It appears that the first "analysis" of the substance being chewed is by the sensitivity of the oral receptors, depending upon the homeostasis of the body. The afferent information that reaches the central nervous system from a substance(s) stimulating the gustatory receptors depends upon the summation of impulses. Erickson³⁵ tested the hypothesis of a "cross-fiber pattern" of response for a number of taste solutions. This was done by recording from thirteen fibers of the chorda tympani nerve to establish a pattern for different taste quality to

of rats.¹⁵⁸

Certain taste buds are characteristically classified as sensitive to one of the four primary tastes, with a tendency for grouping into special areas. The sweet taste is located principally on the anterior surface and tip of the tongue, the salty and sour taste on the two lateral sides of the tongue, and the bitter taste from the circumvallate papillae on the posterior of the tongue.⁵⁵

Evaluation of taste at various localities is a neurologic examination of the cranial nerves. When solutions of the four basic tastes are applied to different areas of the tongue, there is great chance of error and difficulty in determining the deficient area.^{19,89} An improved method of evaluating taste is by anodal galvanic stimulation.⁹⁰

There is an overlap of the different taste sensations throughout the areas of the oropharynx. Taste cannot be completely abolished unless all three nerves are severed,^{111,124} and even then it is difficult. In considering the four types of taste, Moulton¹⁰¹ asks, "Is there any evidence that interaction among these systems does in fact occur? If so, at what level? Does it enhance capacity of the organism to make chemosensory quality discrimination. . .?"

Erickson³⁵ points out that it may be misleading to label a taste fiber as a "salt" fiber because it is maximally sensitive to salts, since it is probably responsible for signaling a number of stimuli.¹¹⁴

The lack of specificity of taste receptors is one reason that it is difficult to abolish taste and problematic to localize

fruit (*synsepalum dulcificum*), which is from a shrub indigenous to tropical West Africa.⁷² When the tongue is subjected to the pulp of its berry, sour items such as lemons taste sweet for approximately two hours afterward. The West African natives often use these fruits to render their stale and acidulated maize bread (kankies) more palatable, and to give sweetness to sour palm wine and beer (pitto). Generally any sour material eaten or drunk will taste pleasantly sweet for several hours after exposure. Salty and bitter taste responses do not appear to be influenced.

The sensitivity change of the gustatory receptors appears to be an important consideration in applied kinesiology nutritional testing. If the body is in homeostasis regarding a specific vitamin or mineral, the gustatory receptors may not be sensitive to it, causing less afferent supply for the central nervous system to consider. On the other hand, in deficiency states the gustatory receptors may be more sensitive, alerting the central nervous system to the need.

Gustatory nerves. Sensation from taste buds on the anterior two-thirds of the tongue passes through cranial nerve V and then through the chorda tympani into cranial nerve VII. Impulses from the circumvallate papillae on the back third of the tongue and other posterior regions of the mouth are transmitted by cranial nerve IX. From the base of the tongue and other parts of the pharyngeal region, impulses are transmitted by cranial nerve X. Taste impulses of the three cranial nerves -- VII, IX, and X -- are transmitted into the tractus solitarius. There are also impulses from cranial nerve XII with taste stimuli to the tongue

responses, though probably not in a taste-specific fashion. One of the more potent and easily disrupted classes of metabolites is that of the vitamins."

The differential recognition of stimuli by the gustatory apparatus can be observed by the topical application of gymnemic acid and its potassium salt to the human tongue. Gymnemic acid applied to the mouth temporarily abolishes the sense of taste for sweet and bitter substances, but not for those that are pungent, sour, or astringent.⁴⁶ Another substance -- gymnema sylvestre -- abolishes only the sense of taste for sweet substances when applied to the tongue.¹⁵ Halpern⁵⁶ proposes, "The primary sites of action of the gymnemic acid and potassium salt could be on the gustatory receptor membrane, within the receptor cells, or on the primary afferent neurons or their synapses with the receptors. Alternatively, the differential suppression of human recognition thresholds by gymnemic acid and potassium salt might be a central effect caused by complex change in the afferent code, or possibly brought about by lingual absorption of gymnemic acid and its subsequent action on the CNS." Measurement of the incised human chorda tympani nerve response when gymnemic acid was topically applied to the tongue indicated the action was primarily on the peripheral portion of the gustatory system.

Halpern summarizes his review of the gustatory afferent system by saying, "The responses of the gustatory afferent system to adequate stimulation can be altered through salivary, neuroendocrine, direct neural, and topical pathways. . . ."

A dramatic example of topical application of a substance changing the sensitivity of the gustatory receptors is miracle

following gastric stimulation. Gastric distention with water produces a 50% increase in gustatory response to sodium chloride. In contrast, quinine irrigation produces a 17% reduction in the impulse rate, as measured at the glossopharyngeal nerve.⁵⁶

Further evidence that the contents of the digestive system can influence the sensitivity of the gustatory receptors is provided by the change in an animal's avoidance-acceptance curve. Halpern⁵⁶ reports on a study in which a dog's stomach was loaded with a hypertonic NaCl solution through a fistula; NaCl-in-milk solutions that the dog previously accepted were refused within three minutes. The stomach was then emptied and washed with warm water and normal NaCl-in-milk, and acceptance returned within one to three minutes. This indicates that the gastric or duodenal chemoreceptors supply the afferent neural inflow for the observed preference changes.

The concentration and constituents of the blood also influence the nervous system to change the avoidance-acceptance curve for various substances. When there is a decrease in plasma Na⁺ concentration, there is an increased oral intake of NaCl. The internal afferent input might be through a CNS interoceptor in the blood vessel. Support for chemoreception in the blood vessel is seen by neural response in the distal portion of the chorda tympani nerve following intravenous injection of saccharin, nicotinic acid, and the bile acid desoxycholic acid.⁵⁶

Halpern states, "Any disruption of normal metabolized levels that alters the environment or substrates of the gustatory receptors or transfer nuclei is likely to change gustatory

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PROPRIOCEPTION AND PIEZOELECTRICITY .

Richard MELDENER D.C.

Diplomate of the I.C.A.K.

ABSTRACT : Muscle proprioceptors imbalance has been treated with piezoelectricity.

* * * * *

Instead of using digital pressure to treat imbalanced muscle proprioceptors (Neuromuscular Spindle cells, Golgi Tendon Organs), local application of static electricity has been successfully used.

Static electricity has been produced with a piezoelectric generator : "QUARTZO" (Reference N°1)

This multiple bipolar electrode instrument creates a low frequency (2 to 3 Hz), low energy (0,05 to 2 mA), high voltage (1500 Volts) current by compression of two quartz stones.

130 grams, pocket size & hand held this instrument is not battery operated.

It is used by placing the head piece of the instrument on dry skin over the imbalanced muscle. Then the operator squeezes and releases several times the built in handle as when operating a pair of scissors. (5 to 30 seconds)

PROPRIOCEPTION AND
PIEZOELECTRICITY.

Richard MELDENER D.C.

Treatment of muscle proprioceptors by piezoelectricity presents several advantages :

- It is well tolerated by the patient with a low pain threshold which seems to become endemic in the present patient population.
- It's efficiency is spectacular as evaluated by observation of modification of treated muscle :
 - * Palpatory pain disappearance,
 - * Elimination of muscle spasm or weakness as evaluated by manual muscle testing and palpation.
 - * Elimination of therapy localization.
- It requires no special training and can be used by the patient at home.

* * * * *

OBSERVATIONS : This instrument provides a low frequency current 1 to 3 Herz which could be compared to the low frequency percussion GOODHEART has researched in 1987.

* * * * *

Reference N°1 : PIEZO instrument can be obtained from
ANATOMIA EUSTON CENTER 21 Hampstead Road LONDON NW1
Great Britain Tel.: 387 57 00 or from La boutique
du Dos 20 Rue de Maubeuge 75009 PARIS FRANCE
Tel.: 42 80 43 28.

R. Peacock, B.App.Sc., D.C.

Abstract: -

This paper outlines the various procedures that have been postulated, since the inception of Applied Kinesiology, for the nutritional analysis of the patient.

Introduction: -

One of the most difficult aspects I originally had in practice was the establishment of a nutritional need that may be present within a patient, which hinders the progress of that particular patient to a higher level of health. The following is the protocol that is used in my clinic to determine nutritional faults.

It is not the purpose of this paper to discuss the mechanisms behind why each technique is an indication for a particular nutrient, as this can be established by researching the various papers listed in the bibliography.

Initially, the Doctor may feel that such a procedure is too extensive to perform, but each part can be broken down over a series of treatments and in fact both parts A and B are generally, performed during the initial consultation and examination, and may also be performed by a trained C.A.

Each test is only an indication of a nutritional need and should not be considered without taking all tests into account.

It is recommended that all switching factors be cleared prior to performing any muscle testing and that a check of a nutritional substance should first and foremost strengthen a weak muscle in the clear, and secondly eradicate positive tests.

The procedure consists of four parts. Part A. is to determine whether the patient is parasympathetic or sympathetic dominant. It does not differentiate between dominance at a cellular level or at the C.N.S. level.

Both parts A. and B. do not involve muscular testing but rather standard diagnostic tests.

Part C. consists of muscle testing using various techniques previously described and part D. involves testing using either oral or nasal challenges. Where applicable structural corrections are also suggested.

PART - A

	B.P.	Δ B.P.	Heart Rate	Indications
Sympathetic Dominant	High Systole High Diastole	Δ BP>15mm	>72	Pantothenic acid, Choline, Adrenal Vit G* Alk ash (R+ Logan) Flexor excercises, coccyx, upper.C.fix
Parasymp Dominant	Low Systole	Δ BP<4mm	< 72	Fe, Mo, tryosine, Glutamic acid B1, B3, B6, Folic acid, Vit. C, Adrenal, Acid Ash (Lt Logan) Pectminor N.L., Upper.C.fix. T.M.J.
Hyper Adrenia	High Diastole	Δ BP>15mm		Adrenal - correct other organic imbalances, Emotional N.V.
Hypo Adrenia	Low Diastole	Δ BP<4mm		Adrenal, Vit.C, pantothenic acid, correct other organic imbalances decrease stress.

(1), (2)

*Vit.G - Riboflavin and niacin, Lipotropic factor, Choline, Inosifol, Befaine, Folic, P.A.B.A.

PART - B

	Normal Adult	Child	Nutrition
1. pH - Oral (3)	7.6	7.8 < 7.6 > 7.6	Increase natural fats & oils along with Vit B*, zymex. acid ash minderals, hydrochloric acid.
Urine	6.2	6.0 > 6.2 < 6.2	Vit.C. Sodium bicarbonate.
- Stool	Neutral	Acid Stool - Alkaline Stool -	Open ileo-cecal valve Vit.B. Chlorophyl comfrey, digestive enzymes, sodium bicarb closed ileo-cecal valve. Calcium orotate lactic acid yeast.
Oral pH ½ an hour after meals. (4)	Indicates Pancreatic problems if overlyacidic		Sodium bicarbonate zinc, pancreatic enzymes
2. Calf pressure test (5)(6)	- measure sphigmanometer pressure that is bearable on each calf. - inequality between Legs - pain tolerance below 180mm.		Small dose E Complex E2 Pre-post cordial tech Sacro-iliac, pronation
3. One leg standing (7)	Patient is unable to balance on one leg with eyes closed.		R.N.A.
4. Leg hops (8)	If patient hops on one leg 10 times then the other pulse should go up 40 beats.		Vit.B*

*Vit.B - B1, B4, B12, Pahtotheric acid.

PART - B (Cont.)

5. L.A.A.T.	(a) Disappearance time 17 Sec. (b) Inequality between sides of tongue.	(a) Vit.C. (b) Cat I II, dural torque. pituitary, B E Technique.
6. Zinc tally	Hydrated zinc sulphate tasted by patient - Grade I Grade II	20ml 3 times 1 day for three days. 20ml 3 times 1 day for two days.
7. Sulkowitz	Grade 1 - clear solution Grade 2 - can read print through test tube. Grade 3 - translucent - see but cannot read print. Grade 4 - Heavy white ppte.	HCL, acidify bowel, increase ca [#] . HCL acidify bowel, increase ca [#] . Normal Vit. F, A, C, D, HCL, Fe.
8. Koenisburgs	Normal 17 - 25 <17 - hyper-adrenia ——— - normal pupil reflex. ——— >25 - hypo-adrenia >10 - severe hypo-adrenia >50 - or <17 with paradoxical pupil - exhaustion stage.	Adrenal protomorphogen ↓emotional stress, <u>alkaline ash, minerals.</u> Adrenal protomorphogen whole adrenal, Vit.C pantothenic. acid, ↓stress, acid ash minerals.
9. Specific gravity.	Normal 1.018 Low thyroid, liver, Kidney.	EFA, HCL, I ₂ , Vit.B Phosphorous.

(9)
(10)

PART - C

1. Electron poisoning. (11)	muscle weakening upon right or left brain activity.	Vic.C. (Lt.brain) Vit E. (R brain). Zn.Mn,Iron Copper. Selenium Vit.A.
2. Pineal (12)(13)	Left leg forward strengthens weak muscles.	Pineal,tryptophane B6.Niacin,folic acid, iron, zinc.
3. Pituitary (12)(13)	Right leg forward strengthens a weak muscle.	Tyrosine, B6, Niacin folic acid Vit.C Copper.
4. Anaerobic challenge (14)	have patient tighten both fists & rapidly flex & extend biceps & triceps as fast as possible for 7-8 Anerobic excess = strong muscle weakens	pantothenic acid Biotin,B1,B2,B3, Magnesium, Molybdenum phosphorous.
5. Aerobic Challenge. (14)	Have patient flex & extend lower limbs alternately 7-8 times Aerobic deficiency = weak muscles do not strengthen.	EFA, B6, B1, B2, B3, B12. Zinc, Maganese, Iron, Carnitine low E.
6. Repeated muscle testing (15)	Repeated rapid muscle testing causes weakness of all muscles.	EFA & co-factors - B1, B2,B3,B6, Vit E, Selesium Vit.C, Magne ium, Iron, Copper Zinc Manganese, Molybdenum.
7. SP21/K27 (16)	Positive SP21 TL is negated by double TL to K27 & also by alkali or acid.	Acid or alkaline ash minerals.
8. Pancreatic allergy (17)	Cross check all weak muscles with pancreatic N.L.	Zinc, Sodium, bicarbonate pancreatic enzymes.

PART - D

1. Clorox (18)	Smelling of hypochlorite weakens a strong muscle.	B6, B3, B12, Folic acid Vit. E, selenium, Vit. C Magnesium EFA Molybdenum.
2. Aldehyde (19)(20)	Patient weakens upon smelling perfume (aldehyde).	B2, B3, B6, Iron Molybdenum.
3. Ammonia (19)(20)	Patient weakens upon smelling ammonia.	B6, Iron Molybdenum α Ketoglutaric acid.
4. Acetic Acid	Patient weakens upon smelling vinegar.	B2, B3, Vit. C, Magnesium pantothenic acid.
5. Acetone (20)	Patient weakens upon smelling acetone.	B1, B2, B3.
6. Aspirin (21)	Patient weakening of a strong muscle or strengthening of a weak muscle upon insalivation of aspirin.	EFA, EPA, B1, B2, B3, B6, Vit. E, Selenium Vit. C, Magnesium Iron Copper Zinc Manganese, Molybdenum.
7. Cysteine (18)	Oral challenge of cysteine strengthens weak muscle.	B6
8. Methionine (16)	Oral challenge of methionine strengthens weak muscle.	B6, Folic Acid, B12 Magnesium.
9. Equitox Yellowdock (22)	Oral challenge of equitox or Yellowdock strengthens a weak muscle.	Equitox, Yellowdock, Iron, Zinc, Molybdenum Vit. C.
10. Copper (23)	Ingestion of copper weakens a strong muscle.	Zinc, Iron, Manganese, Molybdenum Vit. C.
11. Carbamide (24)	Weakens a strong muscle.	Glycine, folic acid Manganese B6.
12. Arginine (24)	Weakens a strong muscle.	Magnesium Biotin, aspartic acid manganese, arginase.
13. Calcium lactate (14)	Weakens a strong muscle.	Pantothenic acid niacin, biotin B1, B2, B6, magnesium, Molybdenum, phosphorous.

PART - D (Cont.)

14. Lingial blood testing. (25)(26)	Place a drop of patients blood or tongue & test for strong muscle weakening indicating auto immune disease or heavy metal toxicity.	Chelating agents e.g. Zinc, Vit.C, or antronex, Biotin Vit.E Molybdenum thymus.
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In the above testing procedures certain nutritional products have been tested that may not be written in the original articles. This is due to personal communication with the authors or from personal experience.

CONCLUSION:-

This article outlines a procedure used in my clinic when attempting to perform a nutritional analysis of a patient. All the material has been previously presented to I.C.A.K. by the various listed authors. An attempt has been made to quote from the original articles and list these original articles, but in some circumstances this was not possible. The paper does not encompass all techniques that have been presented only those techniques that I find important for the nutritional analysis of the patient.

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ALLERGY TESTING & CHECKING THE NUTRIENTDR. R. PEACOCK B.App.Sc., D.C.Abstract: -

This paper discusses an observation that occurred over three years ago, in relationship to pain finding changes noted when a patient is exposed to an allergenic substances. It discusses also the use of nutrition in complimenting Applied Kinesiologic treatment for allergies.

Following the presentation of David Leaf's paper, "Testing Nutrients using Chewing of the Substance (1)" at the Summer meeting 1987, it revived an observation that I had previously felt only occurred in specifically sensitive individuals. What I had noticed was that when some patients were exposed to an allergenic substance an increase in pain findings would occur at specific points. Further investigation since the Summer meeting has shown that most, if not all patients show this immediate increase in pain findings. This point is generally related to the primary area of treatment required to nullify positive muscle testing. Generally it involves either a origin and/or insertion of a related muscle or neurolympatic reflex.

- 2 -

Since noting this observation I have found that complete correction does not occur of an allergenic substance until the pain findings are eliminated.

The procedure used is to test the suspected allergenic substance lingually or nasaly as previously described by Goodheart and other authors, and upon finding a weakness other areas of the body are therapy localised to find negation of a positive allergenic challenge. These areas are then investigated for pain findings which decrease or disappear upon removal of the allergenic substance.

The patient is then re-exposed to the allergen and nutritional products are tested for negation of positive challenge.

The patient is then re-exposed and the standard Applied Kinesiology procedures are performed to negate the positive test.

Upon negation of positive muscle testing the pain findings are checked also for negation. If still present, the nutritional supplement(s), found to negate the original positive muscle tests are chewed to determine which nutritional product eliminates pain findings, and the patient is supplemented on this nutritional product.

.../3

- 3 -

The patient is then requested to avoid the allergen for a short period of time and is only allowed to re-introduce the allergen when all muscle tests are negative and the original pain findings no longer return.

This paper has described an observation that may be used to determine complete correction of an allergenic substance and is a follow on from David Leaf's original observation.

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SCLERANTHUS FOR THE CORRECTION OF SWITCHING

by VICTOR J PORTELLI

Abstract: This paper is presented to demonstrate the efficient use of scleranthus in the elimination of switching signs and symptoms.

Introduction: The author first came to know of scleranthus and its effect on switching from Doctor Mario Sabella, an ICAK Diplomate in Australia, in 1979. Since that time data has been collected in the author's clinics of over 5,000 patients with switching signs and symptoms and the use of scleranthus to eliminate factors associated with switching, including the need for X-crawl.

Scleranthus is a Bach Flower homoepathic remedy and its main use as a Bach Flower is for "...people who may suffer from indecision...lack of ability to make up their minds, ...swayed between two things or possibilities..." (1).

It is also associated with imbalance in life and conversation that may be erratic (2).

Procoedure: During the initial AK evaluation the patient was examined for switching, the need for ocular lock treatment and the need for X-Crawl.

When a positive therapy localisation was discovered for one of these, or all of them, then the cause of the switching problem was investigated. Once the primary cause of switching was discovered, that is, the elimination of the positive therapy localisation of the switching findings, was noted but not corrected. For example, when K27 and Umbilicus would show a

positive therapy localisation then cranial faults, occipital subluxations, atlas subluxations, category faults etc. would be investigated, to determine if one or more faults were the priority for correction but these conditions were not corrected at this point in time.

With the positive therapy localisation still being held a few drops (four drops are sufficient), of scleranthus are placed in the mouth and the muscle retested.

In testing over 5,000 cases with the indicators of switching, ocular lock or X-crawl there was a 100% elimination of the positive therapy localisation. In a very small percentage, of less than 1%, the patients required upto 10 drops. Also in a very small percentage of 2%, the patient had a recurrence of the switching findings on the next visit.

In those 2% of recurrence of switching findings, the patient was given a 5ml bottle of scleranthus to take home and administer four drops four times a day over a three week period. This was effective to eliminate all findings.

The use of scleranthus had no effect on the structural faults analysed in the previous visit, and therefore these still had to be corrected.

The author also tested for various homeopathic strengths and stock strength, but there was no apparent difference in its effect. The dosage strength obviously being cheaper is the preferred choice.

The author did not examine the need for cloacal, labyrinthine or any righting reflexes but the percentage findings of these, after

scleranthus had been used, in the author's clinic is negligible when compared to other AK clinics.

Results

Number of patients tested with switching over an 8 year period	=	5,100
Number of patients on dosage strength 6X	=	4,200
Number of patients on dosage strength 3X	=	200
Number of patients on stock (full) strength	=	700
Number of patients requiring follow up dosages	=	98(2%)
Number of patients requiring more than 4 drops but less than 10 drops to eliminate positive TL	=	8(.156%)
Number of patients still presenting with the same structural faults after dose of scleranthus	=	5,100
% Number of patients who showed no signs of switching after administration of scleranthus	=	100%

Conclusion:

Although, scleranthus does not affect the structural components of the spinal analysis, nor is it (as far as the author can determine) related to any specific muscle weakness, but the statistical information as it relates to the elimination of a positive therapy localisation of switching findings is excellent. One hundred percent of all patients had a change in the findings after a relatively simple treatment procedure of administering a few drops of scleranthus, this means that it abolished the need to manipulate K27 - Umbilicus, X -crawl procedure, GV and CV contacts.

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Copyright 1971.

page 174

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PTOSIS OF THE TRANSVERSE COLON

by VICTOR J PORTELLI

Abstract: This paper is presented to help in the evaluation and management of a condition that has not been addressed before in AK literature, that is ptosis of the transverse colon.

Introduction: Since the discovery of this condition some five and half years ago a number of different signs and symptoms as presented by patients have formed a bizzare picture pattern but yet can be classified by the same functional problem namely ptosis of the transverse colon (PTC).

Many times a recurring ileocaecal valve (ICV) has been corrected and yet the patient continues to present with the typical signs and symptoms.

Also observing other patients from the lateral aspect during the standing postural evaluation repeatedly reveals a weakness of the rectus abdominus and although various treatments and exercises are performed, no apparent change is noted in the postural analysis of the rectus abdominus.

Premenstrual tension type symptoms is another problem that is sometimes difficult to correct. These three problems,

1. recurrent ICV,
 2. weakness of the the abdominals and
 3. premenstrual signs and symptoms,
- can all be due to ptosis of the transverse colon.

Procedure:

Postural evaluation of the trunk region from the lateral aspect typically reveals an increase in the lumbar curve with a

protruded gut anteriorly, below the level of the umbilicus.

The symptomatic picture can be wide spread and bizzare. Previously, the symptom pictures have been concentrated into three different syndromes. Listed next are the major signs and symptoms which I have observed in patients.

1. Any or all the symptoms as associated with the IVC, especially if the IVC condition is a recurring one. The reasoning here is, that if the bowel is constantly under the force of gravity as it is tractioned caudad, the constant stress on the ileocaecal valve causes it to fatigue.

2. Recurrent weakness of the abdominal group especially the rectus abdominus. The rational behind the relationship here is, that the constant pressure of the bowel onto the abdominal muscles due to gravity causes a stretch reflex to be invoked. This constant stretching of the abdominals does not allow the muscle to shorten under normal treatment procedures.

3. Symptoms associated with pre-menstrual tension and menopausal symptoms. Due to the functional pressure of the PTC on the ovaries and the uterus, it can interfere with circulation and nerve supply to these organs. This interference, plus the physical pressure of the bowel onto them can result in hormone changes causing the symptoms associated with premenstrual tension and menopausal syndrome.

4. Symptoms of constant nagging pain in the lower abdominal quadrant.

5. Symptoms of high blood pressure, due to pressure on the venous and lypmhatic return from the lower extremities.

6. Occasional radiculitis due to traction irritation of the lumbar and sacral plexi.
7. Inability to conceive
8. Painful intercourse
9. Recurring vaginal infection
10. Diverticulitis
11. Pseudo-ovarian cyst
12. Ptosis of the Gallbladder into the lower abdominal quadrant

Therapy localisation:

No consistent information on how to therapy localise this condition is available .

Challenge:

Using a strong indicator muscle, use a holding challenge in a caudad direction on the most cephalic point of the bloated bowel (this point represents the upper edge of the transverse colon). If a strong indicator muscle weakens then it is indicative of PTC.

If from observation and palpation you suspect a PTC that does not present itself with this type of challenge then ask the patient to bear down while performing a holding challenge. Occasionally, a muscular individual will contract the abdominals which may prevent the correct execution of the challenge, in this individual ask the patient to relax the abdominal group. Also gravitation testing may be of use, by simply asking the patient to stand against the wall while performing a holding challenge.

Correction:

This is achieved by applying a cephalad scooping posteriorward pressure on the lower portion of the transverse colon and gradually lifting the bowel towards its normal position. Asking the patient to cough several times during this procedure helps for a more speedier correction.

The patient needs to learn how to correct this condition at home before retiring, this will allow the body to heal the fascia of the greater omentum and the transverse mesocolon to give support for the transverse colon. The home instruction is that the patient performs this procedure every night for approximately 3 months. Although this may appear to be a difficult task I have found patient compliance to be excellent, if the condition is explained properly. Gravity is the enemy here, so healing takes time, but the results are worth it.

The patient is also advised not to wear any trouser garments with an elastic support, as this supplies a constant downward pull onto the bowel.

Statistics:

Total patient pool for four years of data	= 3650
Number of patients with PTC	= 1300
Number of male patients with PTC	= 260
Number of female patients with PTC	= 1040
Percentage of symptom presentation	
Abdominal pain, bloating and nausea	= 83%
Sexual dysfunction	= 5%
Back pain, radiculitis	= 8%
PMT and menopausal symptoms	= 36%

Summary:

The evaluation of the ptosis of the transverse colon is simple, the correction is relatively easy and the results very gratifying. Patients often make remarks such as "...My stomach is so much flatter..", "...I've been trying to lose this pot belly for years...", "...my tummy pains are gone...", "...my mood changes are gone..." and "...doctor! I'm pregnant...".

This condition is the cause of many recurring problems and with proper patient education will yield good results.

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