ORIGINAL RESEARCH

Changes in Salivary pH and General Health Status Following the Clinical Application of Bio-Energetic Synchronization

*Ted Morter, Jr., M.A., D.C., Tonya L. Schuster, Ph.D.**

Abstract — The present preliminary study investigated the relationship between autonomic nervous system imbalance, fasting salivary pH, and general health status following the clinical application of Bio-Energetic Synchronization. The clinical objective of Bio-Energetic Synchronization involves the updating or re-setting of inappropriate response physiology mediated through sensory engrams. Clinical observations indicate that the inappropriate expression of response physiology often reflects characteristics of autonomic imbalance. Thus, in view of other studies linking lower fasting salivary pH to sympathetic "stress," salivary pH was investigated as a possible index of physiological change reflecting the clinical objective of Bio-Energetic Synchronization. Twenty four patients attending a four day program, during which each patient received Bio-Energetic Synchronization, were separated into two gender and age matched groups of 12 subjects each. The two groups were categorized according to presenting symptoms or conditions which closely reflected predominantly sympathetic (S-Group) or parasympathetic imbalance (P-Group). Prior to, and four days following the administration of Bio-Energetic Synchronization, participants of the two groups were tested for fasting salivary pH and asked to complete the Rand-36 General Health Status survey. Results revealed, prior to care, that the P-Group had lower, but not significantly different, salivary pH values than the S-Group. Following the administration of Bio-Energetic Sychronization, pH values increased significantly in the S-Group, and decreased significantly in the P-Group. Moreover, the S-Group expressed lower total scores (lower perceived health status) than the P-Group in the Rand-36 survey both pre and post care although the S-Group showed significantly improved scores regarding general health, post-care. Greater pre-post improvement was observed in the S-Group, suggesting a greater overall treatment effect in the S-Group compared to the P-Group. The indication of a greater clinical effect for the S-Group was also supported by a large effect size of 0.80 for pH change, compared to a moderate effect size for the P-Group of 0.50. Based on these preliminary findings it is suggested that measurement of fasting salivary pH may be a reliable non-invasive means of substantiating pre/post intervention changes in autonomic imbalance. Additionally, lower fasting salivary pH values appear to be associated with sympathetic imbalance, while higher values appear to be associated with parasympathetic imbalance. As well, in the present study, subjects in both the S-Group and P-Groups self-reported overall improvement in general health status concomitant with pH changes following the application of Bio-Energetic Synchronization. These preliminary findings support clinical observations suggesting that this approach is associated with restoration of autonomic balance. The relevance of this process to the etiology and correction of vertebral subluxation is discussed.

Key words: Fasting Salivary pH, sympathetic and parasympathetic imbalance, Bio-Energetic Synchronization.

* Tonya L. Schuster, Ph.D., Dept. of Sociology, University of California, Irvine.

Ted Morter, Jr., D.C., is the President of Morter Health System, Inc., and developer of the Bio-Energetic Synchronization Technique.

Address reprint requests to: Dr. Ted Morter, Jr., Morter Health System, Inc., 1000 W. Poplar, Rogers, Arkansas 72756.
Manuscript was received May 15, 1997.

Introduction

Many activities of the autonomic nervous system have been proposed to be responses to cortical engrams, or "motor patterns." Once sensory input has been acquired relative to an event, the information is believed to be stored in the neocortex and regions of the limbic system.

Regarding motor patterns, such as movement, Guyton[1] proposes that engrams, once established in the sensory cortex, are then used as a guide for the motor system to follow in reproducing the same pattern of movement. While this method of

"imprinting" may be useful for establishing necessary redundancy in every day activities, the inappropriate expression of engrams, especially those associated with trauma related events, can have unwanted effects. For example, Kolk and Hart[2] propose that future sensory input which mimics a given past experience may elicit the same motor response. This response often exhibits characteristics of sympathetic or parasympathetic imbalance such as fight or flight physiology, digestive problems, and a host of other "conditions" described as "psychosomatic disorders."[3]

As classically described by Janet,[4] Freud,[5] Pavlov,[6] and recently elaborated by Goleman,[7] the untimely, or "inappropriate" expression of motor responses associated with sensory engrams can manifest in an "out-of-date" fashion. The amygdala, which has been identified as the principal component of the brain which interprets incoming stimuli, via the thalamus, eliciting the appropriate fight or flight response is also recognized as a neural center capable of promoting these same responses in an inappropriate fashion. For example, Goleman[7] identifies the amygdala as sending "out-of-date" responses encompassing movement, norepinephrine secretion, cardiovacular activity, muscular activity, and gastro-intestinal activity. This is best appreciated in view of findings which suggest that neural input processed first through the thalamus travels through a single synapse to the amygdala, then to the neocortex, where it is rationalized.[8,9] This routing permits the amygdala to respond prior to rationalization by the neocortex which promotes stimulus specific responses. By virtue of this pathway, as the repository for emotional memory, the amygdala scans experiences, comparing what is happening now with what happened in the past. Thus, a stimulus occurring in the present, which the amygdala identifies with a past event, will elicit the same physiological response, although inappropriate to current circumstances.

The significance of this phenomenon is that many individuals present to various health care providers with symptoms or dysfunctions, often associated with autonomic nervous system imbalance, or other neurological problems, having no apparent etiology. In recognition of this link between "unexplained" symptoms and "out-of-date" or "inappropriate" responses by the thalamic/amygdala pathway, Bio-Energetic Synchronization[10,11] is a clinical approach which "updates" or "re-sets" engrams eliciting inappropriate physiology often associated with autonomic imbalance.[12] Thus, this approach of "updating" sensory engrams has relevance to a number of disciplines, since any disorder accompanied by an elusive etiology may impact on individual function and overall health. It is also of specific interest to chiropractic as it may provide insight into the etiology of vertebral subluxation, originally described by Palmer,[13] which is yet to be resolved.

Although the administration of Bio-Energetic Synchronization is extensive in scope,[10,11] one aspect of the initial patient evaluation involves the determination of fasting salivary pH, and the ability of the body to alter this pH in response to an acid challenge. While failure to neutralize the acid challenge may be related to the patient's intake of alkaline versus acid forming foods,[14] clinical observations, and other studies, also suggest that patients presenting with predominant sympathetic versus parasympathetic conditions show lower or higher fasting salivary pH, respectively. Moreover, stress and anxiety have been shown to decrease fasting salivary pH.[15-17] That is, human subjects exhibiting sympathetic "stress" demonstrate lower salivary pH values than control subjects. Conversely, there is a suggestion from the literature that salivary pH is higher during relaxation[19] (a time when parasympathetic tone to the salivary glands is greatest) compared to stressful situations. Changes in fasting salivary pH, therefore, may be one indicator of autonomic nervous system imbalance since other characteristics of salivary secretion and composition have also been shown to be regulated by both sympathetic and parasympathetic branches of the autonomic nervous system.[1]

Additionally, while a non-invasive physiological assessment of autonomic imbalance is important in the initial patient assessment prior to administration of Bio-Energetic Synchronization, an indication of self-perceived general health status is also attained. As pointed out by McDowell and Newell,[21] there exists a need to monitor, by valid survey instruments, the outcomes of care and the output of the health system, due to worldwide economic constraints on health care. It is also necessary to consider both objective and subjective (self reporting by patients) assessments which reflect on the efficacy of a particular health oriented care regimen, as each may provide evidence in support of the other. In consideration of these perspectives, the patient-reported information gathered in the present study has been correlated to clinical findings, including fasting salivary pH, to create a holistic health profile for the patient, as well as contributing to an understanding of the influence of Bio-Energetic Synchronization to general health.

Pilot Study

In light of the growing evidence that fasting salivary pH may be a reliable indicator of autonomic imbalance, the present pilot study was conducted to investigate the hypothesis that lower salivary pH would accompany excessive sympathetic stimulation, while higher pH values would accompany parasympathetic predominance. Moreover, since the clinical objective of Bio-Energetic Synchronization involves the restoration of autonomic balance by re-setting or updating sensory engrams, the hypothesis also predicted that salivary pH values would increase or decrease accordingly after administration of care. To provide a more thorough analysis of the significance of Bio-Energetic Synchronization, patient self-perceptions of general health were assessed in relationship to changes in fasting salivary pH.

Methods

Subjects

The study involved twenty four subjects selected from a group of 95 consecutive patients referred to the Morter Health Clinic, in Rogers Arkansas, during the months of August - September, 1996, for an intensive four day treatment regimen[22] of Bio-Energetic Synchronization[10,11] From the pool of 95 patients, only those that presented with complaints that could be reasonably associated with either sympathetic or parasympathetic predominance[1] were selected for the study. From the twenty

four subjects, matched for gender and age, a group of twelve patients presented with a condition or combination of conditions considered indicative of excessive sympathetic stimulation (i.e., heart palpitations, high blood pressure, chronic or acute stress, excessive fatigue), [S-Group], and another twelve with indications suggestive of a predominating parasympathetic imbalance (i.e., digestive problems, impotence), [P-Group] (Table 1). The nature of the study was described to each potential participant. Following the description and a question and answer period, verbal and written consent to participate in the study was obtained from each patient.

Measurements

Salivary pH

Twelve hour fasting salivary pH values were determined by clinic staff, using standard pH paper (with a range of 6.0-8.0) held by the patient in the oral cavity for 20 seconds. Fasting salivary pH was obtained for all subjects prior to the application of Bio-Energetic Synchronization and, again, after the four day period of care. All tests were done within a time frame of 10 minutes at the same time of day to minimize any diurnal influences.

General Health Status

General health status information was collected from all patients using the Rand-36-Item Health Survey.[23] The Survey has been designed to assess physical and emotional health through eight subscales, including: physical functioning (PF), role functioning in regard to physical problems (RPP), role functioning in regard to emotional problems (REP), energy/fatigue (EF), emotional well-being (EW), social functioning (SF), pain (P), and general overall health (GH). The Rand-36 is widely used and is considered a reliable, valid instrument for assessing the eight sub-scales described.[21] Clinic staff administered the survey after the pH measurement prior to the application of Bio-Energetic Synchronization, and again, after the four day period of care.

Analysis of Data

The S-Group and P-Group pH data were compared within

Table 1. General Profile of Gender, Age, and Presenting Conditions of Patients Receiving Bio-Energetic Synchronization

	Age	*Gender*	*Presenting Conditions*	
			Sympathetic	Parasympathetic
Patients				
S-Group				
1.	81	M	Fatigue	
2.	61	F	High Blood Pressure	
3.	54	F	Stress	
4.	64	M	Cardiac Problems	
5.	32	F	Stress	
6.	35	M	Fatigue	
7.	71	M	Tachycardia	
8.	35	F	Severe pain	
9.	38	F	Duodenal ulcer	
10.	68	M	High blood pressure	
11.	58	M	Cardiac arrhythmia	
12.	57	F	Heart palpatations	
P-Group				
1.	54	F		Food Allergy
2.	51	F		Mal-absorption
3.	62	M		Digestive problems
4.	53	M		Allergies
5.	64	M		Impotence
6.	58	M		Impotence
7.	61	M		Indigestion
8.	74	M		Indigestion
9.	36	F		Indigestion
10.	59	F		Indigestion
11.	48	F		Indigestion
12.	69	F		Stomach/Liver

Table 2. Changes in Fasting Salivary pH Before and After Bio-Energetic Synchronization

	pH			
	Pre Treatment (mean ± std. dev.)	*Post Treatment* (mean ± std. dev.)	*p value*	*Effect Size‡*
S-Group*	6.31 ± 0.43	6.67 ± 0.37	0.000	0.80
P-Group*	6.51 ± 0.49	6.29 ± 0.52	0.010	0.50

* The S-Group was composed of patients presenting with one or more conditions presumed to be associated with sympathetic stimulation (i.e., heart palpitations, high blood pressure, chronic or acute stress, excessive fatigue), while the P-Group presented with one or more conditions presumed to be associated with the parasympathetic system (i.e., digestive problems, impotence).

‡ Effect size is determined by Mean 1 - Mean 2 / Standard deviation of Mean 1. A value of 0.20 is a small effect, 0.50 moderate, and 0.80 is considered a large treatment effect.

groups, before and after care, by a paired sample two-tailed t-test with significant differences reported at a confidence interval of 0.05 ($p < 0.05$). Data between the S-Group and the P-Group were compared by a two-tailed t-test assuming unequal variances, with significance reported at $p < 0.05$. Gender and age effects were not evaluated as the distribution of the two groups was age and gender matched.

The Rand-36 survey responses were analyzed according to standard methods wherein higher scores indicated an improved status. Scores were also evaluated within each group by a paired sample two-tailed t-test, and across groups by a two-tailed t-test assuming unequal variances. Probability values of less than 0.05 were adjusted to account for multiple significance testing (0.05/ 8 [number of tests in the Rand-36 survey]) to yield an alpha of 0.006, used to determine significant differences.

Effect size[24] was used to assess clinical significance of both pH values and the Rand-36 scores in all eight sub-scales. Effect size measures the magnitude of mean changes in pre to post treatment values relative to the observed standard deviation of the pre-treatment mean. This statistic is considered a measure of the magnitude of treatment effect. Values of 0.20 represent a small effect, 0.50 a moderate effect, and 0.80 a large effect.

Results

Pre versus Post Treatment Salivary pH changes

Both the "sympathetic" (S-Group) and "parasympathetic" (P-Group) consisted of six females and six males. The average age for each group was 54.5 years ± 16.1, and 54.8 ± 10.3 years, respectively. The results of the pilot study (Table 1-3) show that fasting salivary pH values in the S-Group increased significantly under care from 6.31 ± 0.43 to 6.67 ± 0.37 ($p = 0.000$), whereas the P-Group decreased significantly from 6.51 ± 0.49 to 6.29 ± 0.52 ($p = 0.010$).

Although patients categorized as exhibiting a predominant parasympathetic imbalance (P-Group) demonstrated initially higher fasting salivary pH values than the group categorized as expressing predominant sympathetic imbalance (S-Group), the two groups did not differ significantly from one another prior to treatment. Moreover, post intervention fasting salivary pH values did not differ significantly between the two groups.

There was a larger mean difference between the two groups post-intervention (0.40) pH values compared to their pre-intervention pH values (0.20). This difference was apparently due to an increase in post treatment pH variation within the P-Group, following the application of Bio-Energetic Synchronization, as the standard deviation of the S-Group decreased post treatment. This suggested that the overall response in the P-Group was not as great as the S-Group. This suggestion was tested by determining the extent of the treatment effect for each group, i.e., effect sizes.

Effect sizes for the two groups revealed a large treatment effect in the S-Group (0.80) compared to a moderate effect in the P-Group (0.50). The lower post treatment effect in the P-Group is consistent with the larger variation of pH values observed in this group.

Rand-36 Scores

Changes within the S-Groups and P-Group

With regard to the Rand-36 self-assessment survey, although scores exhibited an increasing trend for 7 or the 8 sub-scales, significant differences were observed within the S-Group for only one of the eight subscales. Scores for the general health sub-scale (GH) increased significantly ($p = 0.000$) from pre to post intervention. Alternatively, while the same trend of increasing scores, pre to post intervention, was observed within the P-Group, Rand-36 scores did not increase significantly for any of the sub-scales. While not statistically significant, it was observed that substantially greater percent changes pre/post intervention occurred between the two groups with regard to the sub-scales. The S-Group showed percent increases in scores for physical functioning (PF) of 42%, compared to 12 % for the P-Group. The S-Groups increased 47% in the sub-scale of role functioning in regard to physical problems (RPP), compared to 8% in the P-Group. A similar large difference, which was significant ($p = 000$) was observed in regard to general health (GH), where an increase of 35% was recorded in the S-Groups compared to 15% in the P-Group.

Table 3. Changes in Rand-36 Item Health Survey Self Reported Scores Before and After Bio-Energetic Synchronization

	*Sub-scales**							
Group	PF	RPP	REP	EF	EW	SF	P	GH
S								
Pre	55 ± 31	32 ± 37	43 ± 43	40 ± 24	59 ± 22	66 ± 32	64 ± 21	51 ± 26
Post	78 ± 20	47 ± 45	47 ± 45	41 ± 25	58 ± 24	68 ± 27	62 ± 24	69 ± 21
p †	0.01	0.30	0.77	0.94	0.70	0.76	0.84	**0.00**
E.S ‡	0.80	0.40	0.10	0.01	0.10	0.10	0.10	0.70
% ±	42.00	47.00	9.00	3.00	-2.00	3.00	-1.00	35.00
P								
Pre	80 ± 20	73 ± 29	86 ± 33	57 ± 20	75 ± 13	86 ± 18	80 ± 19	71 ± 15
Post	90 ± 9	79 ± 26	84 ± 30	70 ± 21	80 ± 19	91 ± 16	78 ± 28	82 ± 14
p	0.07	0.46	0.80	0.13	0.26	0.02	0.77	0.01
E.S.	0.50	0.20	0.10	0.60	0.40	0.30	- 0.10	0.70
% ±	12.00	8.00	-2.00	23.00	7.00	6.00	- 3.00	15.00

* Refer to **Methods**, for sub-scale abbreviations. Increased scores represent improvement.
† Significant ($p < 0.006$) paired (pre- post) two-tailed t-test values are in bold type.
‡ Effect size (E.S.) is determined by Mean 1 - Mean 2 / Standard deviation of Mean 1. A value of 0.20 is a small effect, 0.50 is moderate, and 0.80 is considered a large treatment effect.
% ± Represents percent increase or percent decrease in score, pre/post intervention.

A reversal of substantial percent increase in scores was seen for the P-Group compared to the S-Group in the sub-scales of energy/fatigue (EF). In this sub-scale, an increase of 23% was recorded for the P-Group compared 3% in the S-Group. Changes in other sub-scales did not vary by more than 10%, and were not considered substantial.

The extent of these findings contributed to the apparent greater effect on the S-Group as compared to the P-Group.

Changes Across the S-Group and P-Group

Pre-treatment Comparisons

When comparing across groups, the adjustment for multiple significance testing was relaxed, and significance between the groups was determined at $p < 0.05$. Pre-treatment scores were significantly lower ($p = 0.029$) in the S-Group (55.0 ± 31.0) compared to the P-Group (80.4 ± 20.4) for the physical functioning (PF) sub-scale. Moreover, pre-treatment scores were also significantly different across the two groups for the role functioning regarding physical problems (RPP) sub-scale ($p = 0.010$). In the RPP sub-scale, again, the S-Group self-reported lower (31.8 ± 37.1) than the P-Group (72.9 ± 29.1). As well, the S-Group self-reported significantly lower (42.5 ± 42.9) than the P-Group (86.1 ± 33.3) relative to the role functioning regarding emotional problems (REP) sub-scale ($p = 0.009$). The two groups also differed significantly ($p = 0.038$) in regard to the general health (GH) sub-scale, with pre-treatment scores of 51.3 ± 26.2 versus 70.8 ± 15.1, respectively. In every sub-scale of the Rand-36 questionnaire where statistical differences were determined, the S-Group reported lower scores compared to the P-Group.

Post-treatment Comparisons

Post treatment comparisons were significantly different in the sub-scales for role functioning regarding emotional problems ($p = 0.03$), energy/fatigue ($p = 0.01$), emotional well being ($p = 0.02$), and social functioning ($p = 0.02$). Post intervention score comparisons between the two groups followed the same pattern as pre-treatment scores with the S-Group self-reporting lower scores compared to the P-Group. Scores for the S-Group and P-Group, respectively, were 46.8 ± 44.8 versus 84.2 ± 31.1 in the REP sub-scale, 40.9 ± 25.4 versus 70.4 ± 20.9 for EF, 57.5 ± 24.1 compared to 80.0 ± 19.1 regarding EW, and 68.4 ± 26.7 versus 90.7 ± 16.1 for the SF sub-scale.

In the sub-scales described, the S-Group self-reported lower Rand-36 scores both pre and post treatment, compared to the P-Group. However, with the exception of the REP sub-scale, in the other three sub-scales (described above; PF, RPP, and GH) where pre-treatment scores differed across the groups, post treat-

ment scores did not. As with changes in salivary pH, this also suggested a larger response in perceived health after treatment for the S-Group. This finding was also in agreement with the substantially different changes in percent improvement found in the same sub-scales in the S-Group compared to the P-Group. Effect size determinations for the three categories further substantiated this finding, with values for the S-Group of 0.80 (PF), 0.40 (RPP), and 0.70 (GH), with a mean for the three of 0.63 ± 0.21. By comparison, effect sizes for the same sub-scales within the P-Group were 0.50, 0.20, and 0.70, with a mean of 0.47 ± 0.25. In the one sub-scale where post treatment scores were also significantly different (REP), no treatment effect could be shown for either group as effect size for both was 0.10.

Discussion and Conclusions

The present pilot study focused on evaluating previous clinical observations that suggested an association between fasting salivary pH and presenting complaints suggestive of sympathetic and/or parasympathetic imbalance. A secondary focus was to assess self-reported perceptions of health status prior to and following Bio-Energetic Synchronization. This approach has provided information regarding the effects of treatment on an objective physiological indicator (fasting salivary pH), as well as effects on the subjective component of self-assessment of health. In regard to both components, the findings of this study are consistent with prior clinical observations, and are also consistent with other studies linking sympathetic "stress" with lower salivary pH values. Moreover, the self-reported improvement in the sub-scales of the Rand-36 health assessment instrument by the subject population of the present study confirms similar findings from a different population of patients receiving Bio-Energetic Synchronization.[23] Finally, the results of the present study also suggest, indirectly, that the application of Bio-Energetic Synchronization shows health benefits by reducing sympathetic imbalance. This conclusion is based in part on the observation that initial lower fasting salivary pH values increased significantly following treatment in those individuals presenting with conditions presumed to be associated with excessive sympathetic stimulation (i.e., heart palpitations, high blood pressure, chronic or acute stress, excessive fatigue). Evidence of improvement in the health status of these individuals, indicated by the significant increase in self reported scores of the general health sub-scale of the Rand-36, further supports this conclusion. Moreover, the effect size of 0.70 for this sub-scale attest to a substantial clinical effect.

While an association has been made in the literature between a lower fasting salivary pH and excessive sympathetic activity, to the best of the authors' knowledge, no information suggests how excessive parasympathetic activity may be detected in the same measure. The present study provides the first evidence that fasting salivary pH may be elevated during parasympathetic imbalance. In addition, it appears that following administration of Bio-Energetic Synchronization, parasympathetic balance may be restored. The significant decrease in post treatment fasting salivary pH values, coupled with substantial percent increase in Rand-36 scores in the general health sub-scale lend credence to this proposal.

Of further interest are the relative differences in treatment effect (effect sizes) among those patients presumed to have excessive sympathetic activity, compared to excessive parasympathetic activity. The larger treatment effects accompanied by overall lower self reported Rand-36 scores noted in the S-Group, when compared to the P-Group, may be partially explained by the nature of sympathetic versus parasympathetic problems. It is plausible that the putative sympathetic conditions prevalent in the population under study were more debilitating in nature, or impacted more dramatically on the subjects than those associated with the parasympathetic system. This could lead to a lower initial self assessment. Consequently, post treatment values would have a higher ceiling, allowing for a greater effect size. Moreover, there are a number of issues which have been considered as possible forms of population bias regarding self-reported assessments, [22] and consequently, the results of this study must be interpreted cautiously. The number of subjects is a concern that future study will address through a larger sample size. Also, the significance of short term self re-evaluation may contribute to bias, although evidence supporting this view point is, to the authors' knowledge, not available.

As symptoms of sympathetic and parasympathetic activity could readily be present in the same individual, with overlap occurring, it is difficult to know the extent of predominance of one or the other condition in patients participating in this study. This may account for the lack of significant difference in initial fasting salivary pH values. However, each group, categorized according to presumed sympathetic versus parasympathetic imbalance, did demonstrate changes in fasting salivary pH as predicted. This suggests, in retrospect, that one or the other condition of autonomic imbalance was predominating. This evidence indicates that measurement of fasting salivary pH before and after a course of treatment may be a viable approach to monitoring autonomic balance. This finding has application to other health related disciplines which seek a non-invasive measure of the status of autonomic balance within given patient populations. However, as several of the subjects in the present study presented with a combination of conditions, additional study will be necessary to determine if fasting salivary pH is more distinct in its range in individuals presenting with singular conditions.

Since normative data for fasting salivary pH in sympathetic versus parasympathetic predominance has yet to be documented, it is not currently possible to determine on initial evaluation if a subject is below or above a certain "normal" value. Moreover, in the absence of normative data, it is not known if "normal" is individual specific or if it falls within a predictable range. Therefore, future studies in which fasting salivary pH values are determined should be linked to the presumed state of autonomic balance in the subject pool. This would permit the development of a database of fasting salivary pH values across the spectrum of varying levels of balance between the sympathetic and parasympathetic.

While the present study was preliminary in nature, further investigation utilizing a pH meter for sensitive measurement, as well as more subjects will be necessary to substantiate the validity of these initial findings and to further diminish the possibility of type I or type II errors. For example, this study has

revealed changes in pH values as low as 0.22 units. Thus, for a power of 80% at an alpha of 0.05 for a two-tailed test, future studies will have to have a minimum of 66 subjects in each group to reliably detect differences of 20% between pH values. A similar number of subjects will be required to obtain the same level of power for the eight sub-scales of the Rand-36 General Health Questionnaire.

Although the present study was designed to reflect an even distribution of gender and age, it will be necessary in future investigations to consider the effects of gender and a broader range of age differences. Both of these factors could mask differences, accounting for the lack of significant findings between the groups in the areas studied. Additionally, while the present study was not designed to determine if any particular condition was corrected, it will important to follow the course of symptom reduction concomitant with other parameters which measure autonomic balance and self perceptions of health. While these issues will be addressed in future studies to thoroughly assess the repeatability of findings reported in this article, the information gained from this preliminary study suggests an interesting association between the application of Bio-Energetic Synchronization and sympathetic as well as parasympathetic balance. It is anticipated that further study will clarify if this approach to up-dating cortical engrams is consistently related to restoration of autonomic balance in subjects exhibiting sympathetic or parasympathetic predominance.

Moreover, the factors described as minimum to the vertebral subluxation are intimately linked to the type of responses associated with autonomic imbalance. These include hyper or hypo activity of the paraspinal musculature, change in juxtaposition of vertebrae and contiguous structures of the spine, as well as soft tissue aberrations and neurological involvement. It will be of interest to conduct double blind cross over studies assessing for the presence or reduction of vertebral subluxation following administration of Bio-Energetic Synchronization.

References

1. Guyton A. 1986. Textbook of Medical Physiology. Philadelphia: W.B. Saunders.
2. Kolk B, Hart O. The Intrusive Past: The Flexibility of Memory and the Engraving of Trauma. American Imago 1991; 48: 425-454.
3. Hinsie LE, Campbell, RJ. Psychiatric Dictionary (3rd ed.). New York: Oxford University Press. 1960.
4. Janet P. 1889. L'Automatisme Psychologique. Paris, Alcan.
5. Freud S. Introduction to Psychoanalysis and the War Neuroses. Standard Edition. 17: 207 - 210 (1919). Translated and edited by Strachey. London: Hogarth Press (1954).
6. Pavlov I. 1926. Conditional Reflexes: An Investigation of the Physiological Activity of the Cerebral Cortex. Translated and edited by GV Anrep. New York: Dover Publications.
7. Goleman D. 1995. Emotional Intelligence. New York: Bantam Books.
8. LeDoux J. Sensory Systems and Emotion. Integrative Psychiatry 1986; 4.
9. LeDoux. Emotion and the Limbic System Concept. Concepts in Neuroscience 1992; 2.
10. Morter MT. 1996. Rationale and Evidential Basis for the Bio Energetic Synchronization Technique and its Clinical Application. Morter HealthSystem, Inc., 1000 W. Poplar, Rogers, Arkansas 72756.
11. Morter MT. The Theoretical Basis and Rationale for the Clinical Application of Bio-Energetic Synchronization. Journal of Vertebral Subluxation Research 1997; 2(1): 40-50.
12. Lee T. Thalamic Neuron Theory: Theoretical Basis for the Role Played by the Central Nervous System (CNS) in the Causes and Cures of All Diseases. Medical Hypotheses 1994; 43: 285-302.
13. Palmer B J. The subluxation specific-the adjustment specific. Davenport IA: Palmer School of Chiropractic. 1934 (1986 printing).
14. Thibodeau G, Patton T. 1993. Anatomy and Physiology. Baltimore: Mosby
15. Chorot P, Sandin B, Fernandez-Trespalacios J. Pavlovian conditioning of phobic fear: effects on skin and salivary pH. International Journal of Psychosomatics 1992; 39: 56-61.
16. Sandin B & Charot P. Changes in Skin, Salivary and Urinary pH as Indicators of Anxiety Level in Humans. Psychophysiology 1985; 22: 226-230.
17. Morse D. et al. Stress, Relaxation and Saliva: A Follow-up Study, involving Clinical Endodontic Patients. Journal of Human Stress 1981; 7: 19-36.
18. Sandin B, Charot P. Posibilidad de Medir la Ansiedad Humana a Traves del pH Salival. Psicruis 1979; 3: 52-66.
19. Morse D. et al. Examination-Induced Stress, in Meditators and Non-meditators as Measured by Salivary Protein Changes. Stress 1981; 2: 20-24.
20. Perez Casas A & Benguechea E. Morfologia, Estructura y-Function de los Centros Nerviosos. Madrid 1975; Paz Montalvo.
21. McDowell I & Newell C. 1996. Measuring Health: A Guide to Rating Scales and Questionnaires. New York. Oxford University Press.
22. Hawk C & Morter T. The Use of Measures of General Health Status in Chiropractic Patients: A Pilot Study. Palmer Journal of Research 1995: 2 (2): 39-44.
23. Ware J E, Snow K K, Kosinski M, et al. SF-36 Health survey: manual and interpretation guide. Boston Mass: The Health Institute, New England Medical Center, 1993.
24. Kazis L, Anderson J, Meenan R. Effect Sizes for Interpreting Health Status. Medical Care 1986: 27 (3): s178-s189.

The Theoretical Basis and Rationale for the Clinical Application of Bio-Energetic Synchronization

Ted Morter, Jr., M.A., D.C.

Abstract — This paper describes the theoretical basis and rationale for the clinical application of Bio-Energetic Synchronization, an approach which has application to the etiology and correction of vertebral subluxation. Bio-Energetic Synchronization derives its name from the fact that it is applied to the human biological system which engages in energy exchange with the environment. Furthermore, outcomes have indicated that its application allows the body to enhance the utilization of energetic forces in a synchronized manner. Since 1975, emphasis has been placed on describing the rationale of Bio-Energetic Synchronization and developing the most efficacious methods of administering it clinically. This paper presents a refinement of information which reflects both of these goals.

Key Words: Bio-energetic synchronization, vertebral subluxation, cortical engram, sensory engram, biomagnetism, therapeutic touch, biofield energy, neurological interference.

Introduction

Bio-Energetic Synchronization[1,2] is closely linked to the concepts of cellular communication, biomagnetic segmentation, pulsation synchronization, and up-dating of sensory engrams. The objective is to restore balance to the systems through which the above processes are expressed. Through Bio-Energetic Synchronization, it is proposed that the body regains control over the interference which provoked the imbalance. Relative to chiropractic, this has implications for both the etiology and correction of vertebral subluxation and/or musculoskeletal imbalances either contributing to the vertebral subluxation or resulting from it.

While a more thorough treatise of Bio-Energetic Synchronization is presented in document format,[2] the present article describes various phenomena, which coupled together, are believed to account for the reported benefits associated with the clinical application of Bio-Energetic Synchronization.[3] Moreover, described herein, is an overview of the methodology associated with this approach.

Address reprint requests to: Dr. Ted Morter, Jr., Morter Health System, Inc., 1000 W. Poplar, Rogers, Arkansas 72756.
Manuscript was received on May 2, 1997

Theoretical Basis and Rationale Underlying Bio-Energetic Synchronization

Cellular Communication

Considerable study has demonstrated that cells have an extensive array of communication systems. These include informational molecules attaching to cell surfaces,[4] chemotaxis,[5] contact paralysis,[6] and morphological cues expressed during human embryonic development.[7-9] Thus, cell-cell, as well as cellular communication with the external environment, is a well documented phenomenon. Consequently, it can readily be appreciated that the human organism relies upon these, and likely other forms of communication, to maintain its survival and function. When interference to communication is present, it follows that the functions of the organism become compromised, with pathology or even death being the end result.

Consistent with the level of communication existing between the cell and its external environment, is the concept of shifting energy fields. While this idea was first proposed by the author, in 1976,[10] similar concepts have recently gained notoriety.[11-13] As originally described, relative to Bio-Energetic Synchronization, the total energy content of the individual is believed to be apportioned between the emotional, physical, and mental fields. When the living system is freely adaptive, these energy fields also shift freely between one another. It is proposed that these communicating energy "fields" are internal, an idea receiving recent support from the neurosciences relative to non-synaptic transmission between nerve cells.[14] Moreover, it is also

proposed that an energy field emanating from the body serves as its primary sensor to the external environment. It is plausible that this field is synonomous with or partly represented by the "corona" which has been identified through Kirilian photography.[15] For example, its role as a sensor can be related to a situation in which a sudden fright would first be perceived by the external field. This would generate a shift in the internal mental field, which would then be transmitted to the emotional and physical fields. Relief from the threatening situation would also be perceived by the external field, bringing a restoration of energy to the deficient mental field. Although expressed in different terms, this phenomenon is routinely described in physiology as the "fight or flight" response.[16] It appears readily plausible that neurotransmitters or other molecular substances could mediate utilization of energy shifted into the physical realm by initiating work in the form of muscle contraction and acceleration of biochemical pathways to maintain the higher energy requirements during the stressful response. Additionally, endocrinology has long recognized the dramatic effects of "pheromones," or volatile hormones which "float" about in the external environment before being imbibed or otherwise perceived by an organism, subsequently promoting physiological changes in the recipient.[17] Perhaps pheromones elicit their action by first interacting with the external energy field.

While the "adaptive" process described is essential to human survival, socialization, with its many perceived "threats" has imposed a modification of this response. It is not uncommon to witness individuals who appear to be under long term "fight or flight," as part of the General Adaptation Syndrome (GAS).[16] If one enters the chronic "exhaustion" phase of this syndrome pathologies including atrophy of the thymus, spleen, and lymph tissues often occur; further leading to diminished immune function. Fright is not the only initiator of this phenomenon. Anxiety, excitement, physical trauma, and even the day to day accumulation of petty annoyances could be expected to promote energy shifting from the mental to the physical and emotional fields. Consequently, rather than short term (acute) effects, long term or chronic adaptation with its many pathological consequences would be likely.

Although circulation, distribution, regulation, and synchronization of the body's field energy is believed to be mediated through innate pathways, clinical observations lead to the conclusion that "blockages" to these pathways occur. As presented in the Clinical Application section of this article, specific contacts to the body serve as "switches" (much like Chinese acupuncture gates) to resolve these "blockages," thus allowing the natural balance of energy to occur.

Stimuli, perceived by the body as stress, may elicit a sympathetic response.[16] It is postulated that this response results in a redistribution of energy among the mental, emotional, and physical fields. The "excess" energy which accumulates in some part of the body may register as pain, while the area which was made deficient by the transfer could become susceptible to pathology. Rather than concentrating on elimination of the pain, this hypothesis suggests that restoration of the deficiency in the energy field would be more appropriate.

In this regard, it is reasonable to assume that a shift in energy from the mental, emotional, or physical realm could ultimately manifest through the weaker links of the body. One such expression of this phenomenon may be the vertebral subluxation, as described by B.J. Palmer.[18]

That is, if the shift in energy is expressed at the level of the spine, creating nerve interference, this interference to neurological function, in and of itself, could create a cascading effect manifesting in a diversity of somatic pathologies including vertebral subluxation.

Biomagnetic Segmentation

As described above, modern science recognizes that physiological dysfunction can arise from a breakdown of endogenous and/or exogenous cell communication. Since a basic tenet of Bio-Energetic Synchronization is that both endogenous and exogenous cellular communication establishes and maintains a balanced apportionment of energy between the mental, emotional, and physical realms, it is necessary to propose a description of the nature of the energy involved.

In 1981,[19] biomagnetism was hypothesized to be an integral component of the theoretical basis of Bio-Energetic Synchronization. Special emphasis was placed on the orientation of magnetic fields emitted from various anatomical regions, as well as the effects of applying magnetic energy to these same regions. Since that time, considerable multidisciplinary interest in biomagnetism has evolved. Biomagnetic fields have been detected from the human body by the use of a Superconducting Quantum Interference Device (SQUID). These fields, in the range of nano to milli Teslas, are now being mapped for the purpose of obtaining low-resolution images of internal body structures.[20] Additionally, large biomagnetic field strengths have been detected from the human hand,[21] with the proposal that the large emission of biomagnetism from certain individuals represents an expression of external "Chi, or Qi." It is of interest that the approximate 1,000 fold increase in magnetic field strength over normal human biomagnetism was not accompanied by any corresponding bioelectric current change in the individual studied. While the source of the increased biomagnetism was unclear, it was concluded that it was not generated from internal body current alone.[21]

Payne[22] presents information suggesting that external magnetic fields enhance blood flow, affect changes in calcium metabolism, alter the pH balance of various body fluids, affect the release of certain hormones, and alter some enzyme activities. Nagawa[23] asserts that modern society's plethora of alternating current electrical devices have diminished the earth's natural magnetic field fluctuations to the point of creating a "Magnetic Field Deficiency Syndrome," in susceptible humans resulting in a long list of symptoms. Apparently, this claim has not gone unnoticed, as much of contemporary research in biomagnetism is focused on the diagnostic value of changes in the body's magnetic fields.[24,25]

Thus, based on the information available currently, it is apparent that "energy fields" do emit from the body, and that biomagnetism can be considered to both contribute to these fields, as well as influence them. The significance of biomagnetic orientation in regard to the clinical application of Bio-Energetic Synchronization is described in the Clinical Application section.

Pulsation Synchronization

Another contributing component to "field energy" is postulated to be cellular and organismal "pulsations" or "beats" which produce waves. These pulsations are likely to be derived from other wave producing phenomena which have variously described as biological rhythms,[26] synchronous oscillations or phase transitions,[27] or stereotyped movement.[28] The tendency for similar functions of the body to oscillate in phase (synchronously) internally, or with an external rhythmic source (metronome), has been well documented.[27] While the sum total of all systems may elicit a synchronous pulsation, perceived externally, it is important to recognize that not all functional systems of the body may oscillate in synchrony with one another. For example, the cells of the liver may not oscillate simultaneously with the heart.

Since oscillating movements can be detected at the molecular level,[29] as well as the organismal level, it has been speculated[27] that oscillation at the organismal level is the net super-impositional result of all other lower level oscillations. In animal models, when oscillations are observed to occur in synchrony, groups of similar cells or linked organs within one organism, or even numerous organisms of the same species are usually involved. If waves emanating from different groups of like cells, or individuals oscillating at the same frequency and amplitudes, are superimposed (pass through the same space at the same time) one pattern will usually entrain the other, resulting in a magnified synchronous oscillation expressed as one wave of the same frequency but twice the amplitude, a phenomenon known as constructive interference.[29]

However, since different regions of like cells (or linked tissues or organs) in one organism can oscillate at slightly different frequencies (heart vs. lung vs. stomach), a special super-impositional pattern emerges when they overlap. This pattern can be described by imagining the sound of a tuning fork of a known wave frequency being compared to a note, supposedly of the same wave frequency, on a piano. If the two sounds are not identical the waves produced will overlap in and out of phase with one another. At those points when they are in phase, constructive interference will occur and a large amplitude wave will be produced. When they are out of phase they will cancel one another.[29] Consequently, the in and out of phase movement, which occurs on a regular basis, will be heard as a "beat" or visualized as a "pulsation."

With the many different wave producing phenomena of slightly different frequencies being generated within the human body, it is not surprising that the organism as a whole would emit a regular "beat" or "pulsation." When each group of oscillators is synchronized, the organismal "pulsation" will reflect a characteristic rhythm. When maladaptation occurs in a given group of similar functioning cells (oscillating group) that closely linked group of cells or tissues is likely to fluctuate out of synchrony. Not only could this be interpreted as a signal that normal function of the cell or tissue group is being disrupted, but the change in oscillation pattern, itself, is likely to be affect the "pulsation" rhythm at the organismal level.

As described in the Clinical Application section, one of the goals of Bio-Energetic Synchronization is to bring the various systems of the body into their natural oscillatory pattern. When this is achieved, it is perceived as a regular organismal "pulsation" rhythm. The restoration of the natural oscillatory pattern to dysfunctional oscillatory groups, is referred to as pulsation synchronization. This natural oscillatory pattern has been clinically observed to occur simultaneously at any two places on the body.

Sensory (Memory) Engrams and Inappropriate Physiology (Timing Problems)

It has been proposed that a wide variety of physiological dysfunctions are associated with inappropriately expressed cortical response patterns, learned throughout life.[30-32] Physiologists have proposed "learned" motor skills to be the result of muscular responses to sensory engrams, or "memory patterns." Once sufficient sensory input has been acquired, requiring a specific motor response, the response can then be elicited through the stored sensory engram depicting that event. This stored information, or memory, is then used by the body to promote a particular motor activity. Guyton[33] states:

> "Once a sensory engram has been established in the sensory cortex—that is, once the movement has been learned—the person then uses this sensory engram as a guide for the motor system of the brain to follow in reproducing the same pattern of movement...to do this, the sensory signals from the fingers, hands, and arms are compared with the engram, and if the two do not match each other, the difference, called the error, supposedly initiates additional motor signals that automatically activate appropriate muscles to bring the fingers, hands, and arms into the necessary sequential attitudes for performance of the task."

It is commonly believed that elicited thoughts associated with fear or anxiety can promote neurological responses equivalent to the initial event.[30-32] For example, if a person experiences a fright or great joy (stress), both sympathetic and parasympathetic stimulation occur which affects blood pressure, muscle activity, digestion, vision, perspiration, and other factors. The same neurological response can be elicited at a later time if the person "re-lives" the event at or below the conscious level. The frightening or joyous event (both emotional) which resulted in a short term burst of neurological response is know as stress, a situation to which the body is well adapted. When the body is operating in the mode of expressing engrams associated with traumatic events, it also exhibits the characteristics associated with neurological "switching" adaptations. For example, if an individual steps on a nail, the body automatically shifts weight bearing to the opposite leg. In this regard, the body compensates for the loss of normal function resulting from the trauma by "switching" to an adaptive pattern of response.

The memory of the stressful event and any neurological "switching" which accompanied the response is also stored as part of the engram. If the engram is elicited and subsequently expressed inappropriately, this is regarded as a "timing prob-

lem." That is, the response is appropriate to the event but not its memory. If re-living the event and the neurological "switching" that accompanied the body's response continues, consciously or unconsciously evoked, the response condition then becomes one of "distress," a condition to which the body is not well adapted. The physiology of distress can readily lead to a wide variety of conditions in the body which could produce pathology. These include such reactions as overproduction of stomach acid, diarrhea, hives, palpitations, respiratory imbalance, profuse sweating, blurring of vision, and prolonged muscle contraction. The last mentioned reaction could readily lead to muscles creating a dis-relationship between vertebrae. If this is accompanied by insult to surrounding tissues sufficient to interfere with the flow of neural activity, any number of conditions including various disease states, and musculoskeletal aberrations including vertebral subluxation could result.

Other than as a result of physical trauma, a vertebral subluxation is likely to have a similar etiology to other psychosomatic conditions. Since there are numerous engrams stored for expression at appropriate times, it is not difficult to recognize that the frequent inappropriate expression of one or more engrams could have an on-going detrimental effect on the body. It is also reasonable to assume that as long as the engram is being expressed inappropriately, the subluxation sequelae will likely continue. This concept is important in regard to the usual chiropractic practice of locating and applying an osseous "adjustment" to affect the misalignment component of vertebral subluxation. Even when an adjustment is successful, if the sensory engram etiology of the subluxation is uncorrected, the condition is likely to shortly reappear, thus constituting a *Sensory Dominant Subluxation* (SDS).

It is proposed that changes in the normal biomagnetic energy field distribution can lead, through inappropriate physiological responses, to the wide range of metabolic dysfunctions, pathologies, and biomechanical problems currently treated by the many health disciplines and allopathic medicine. These changes not only impose dysfunction on various body systems, but also create interference to the neurological sensory input/motor output loop. Until eliminated, this interference interrupts the normal flow of sensory information necessary to re-set inappropriate cortical output derived from sensory engrams.

Objective of Bio-Energetic Synchronization

The principal objective of the application of Bio-Energetic Synchronization is to locate and remove neurological interference which, other than physical trauma, is postulated to promote various homeostatic imbalances. The alleviation of interference to the nervous system is also believed to promote restoration of muscle symmetry by re-setting the balance between neurological afferent input to the higher cortical centers and efferent cerebellar motor outflow. The restored motor balance is postulated to affect vertebral subluxation by repositioning of the vertebra and contiguous articulations. Moreover, removal of neurological interference is postulated to improve visceral function and the reduction of defense physiology.

Clinical Application of Bio-Energetic Synchronization

Overview

The clinical basis and practice of Bio-Energetic Synchronization can be applied singularly or in combination with methodologies unique to various disciplines. It is presented in two Levels of Care. The first, referred to as Basic Care, focuses on the detection and countering of information errors (neural interference) filtering through the cerebellum which affect skeletal muscle tone and other autonomic neural output. These errors are countered by updating memory associated with skeletal muscle tone. Advanced Care further counters information errors derived from previous sensory engrams by updating information to the thalamus and hypothalamus with the intent of improving internal function and physiological responses to subconscious and/or conscious memory of experiences and feelings.

Clinical Significance of Biomagnetic North/South Segmentation and Pulsation Synchronization

Clinical observation through palpation, and comparison against a standard magnet, suggests that the body normally expresses a uniform biomagnetic field, and synchronized whole body pulsation. As described in the Introduction, whole body synchronized pulsation is likely the concomitant effect of all organ pulsations manifesting in one global pattern. This pattern is believed to be accompanied by a uniform cellular communication wherein individual cells are joined magnetically North to South throughout the body.

Unlike other areas of the body, however, the hands have been shown to normally express magnetic North/South polarization when challenged with any magnetic source. Assignment of magnetic polarity to the regions of the hand is based on clinical observations regarding application of the North and South poles of a bar magnet to various anatomical regions (Figure 1). When muscles, *which are part of the segmentation patterns described and discussed below,* are challenged before and after application of the magnet, one pole will strengthen the muscle while the other pole will weaken the same muscle. Since various regions of the hands have been shown to elicit the same response, they have been assigned the same magnetic polarity as the standard bar magnet.

Following this method of differentiating magnetic polarity, the palm and the middle and small fingers of the right hand are magnetic North seeking, while the index and ring finger are magnetic South seeking. The palm and the middle and small fingers of the left hand are magnetic South seeking, while the index and ring fingers are magnetic North seeking. The dorsal side of each hand is opposite in magnetic polarity to the palmar side. The thumbs are neutral on both hands.

Clinically, when making physical contacts on the patient during Bio-Energetic Synchronization, if the practitioner applies a North digit to a South segmented area of the body, energy will be exchanged between patient and doctor. This has been clinically observed to "drain" the practitioner, but rejuvenate the patient. Consequently, it is important for the practitioner to

make physical contact with areas of the hand which are the same in polarity to the segmented areas of the patient's body. When this is done, it is hypothesized that the repulsive forces between the practitioner and the patient force the patient's energy back into the segmented area thus disrupting or "breaking up" the biomagnetic segmentation. The various segmentation patterns are discussed below.

When any one or more body systems are dysfunctional, it is hypothesized that the body compensates by altering its uniform biomagnetic relationship into one manifested as *biomagnetic segmentation*. These various patterning arrangements, which have been detected through clinical observation, have lines of demarcation which seem to follow the borders of muscles. This response appears to be an accommodation to what would otherwise be a scrambling or disorganization of cellular communication occurring when the body is stressed beyond its ability to retain the usual North/South magnetic relationship. The segmentation patterns of North/South cellular communication, evaluated over approximately twenty years of clinical observation, are depicted in Figure 1. Clinical observations have similarly revealed that concomitant with biomagnetic segmentation, the whole body pulsation will become asynchronous. Areas of asynchronous pulsation are perceived similar to arterial pulses and may be tender to the touch expressing slight edema indentations. In chronic conditions, hard nodules may be present at these sites. As pulsations are hypothesized to be the medium through which the body communicates its various activities, the asynchronous pulsations are, subsequently, believed to represent communication interference throughout the body.

When segmentation is eliminated, all else being equal, whole body pulsation synchronization is also restored. Although segmentation can take a variety of forms, biomagnetic North/South segmentation has been shown clinically to be detectable through specific contact points correlated with muscle imbalance and change in muscle strength. Through the application of appropriate contacts made by specific regions of the practitioner's hands, areas of segmentation are eliminated. When this occurs, synchrony is subsequently restored to the whole body pulse. The elimination of biomagnetic segmentation and restoration of whole body pulse synchrony are postulated to eliminate this form of interference to the normal flow of neurological information throughout the body. This restoration of normal energy flow is accompanied by change in a number of clinical indicators, as described in the clinical protocol.

Bio-magnetic segmentation must be eliminated to permit the body's restorative processes, evoked through the protocols of Bio-Energetic Synchronization, to be effective.

Basic Care

Commencing Basic Care, patients often present with physiology that is inappropriate to present need, or as described above, a "timing problem." Timing problems and the presence of vertebral subluxation are evaluated as described below.

Inappropriate Physiology and Sensory Dominant Subluxation

Methods and Clinical Objective

Basic Care involves correction of the affects of inappropriate expression of sensory engrams on specific systems of the body, which may involve the skeletal musculature and the viscera. Aside from the expression of sensory engrams on the physiology of homeostasis, effects on the various systems of the body may also result in the formation of Sensory Dominant

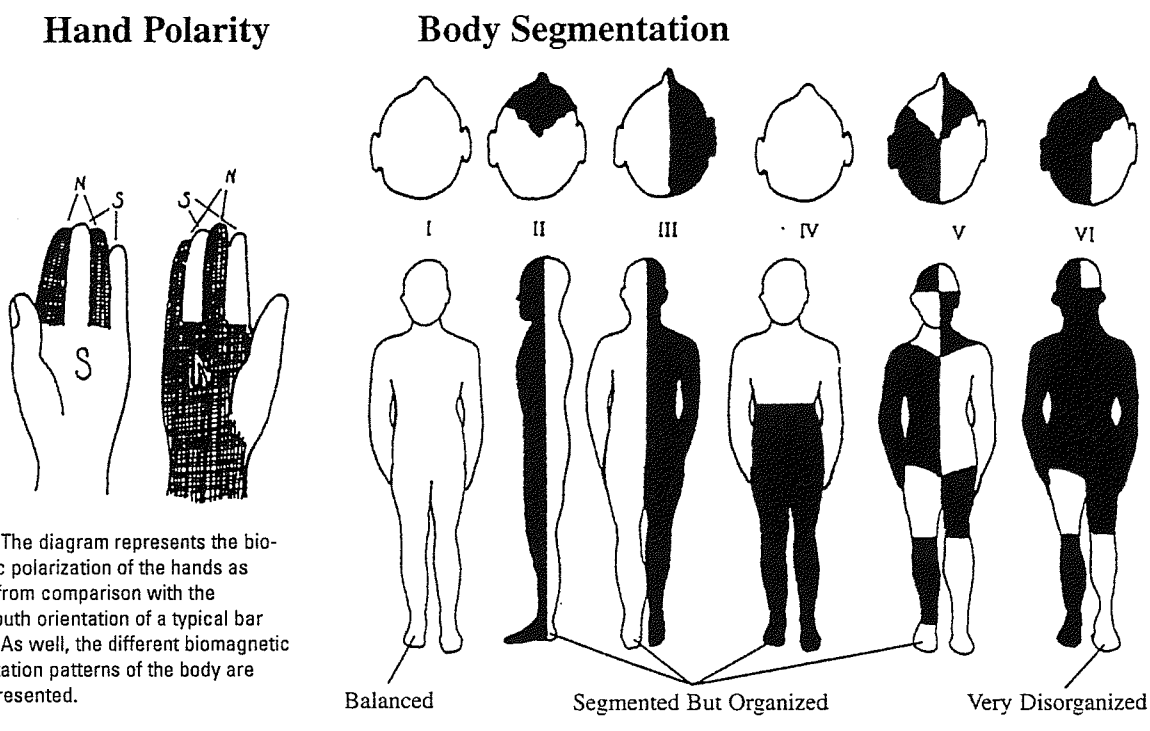

Figure 1 The diagram represents the biomagnetic polarization of the hands as derived from comparison with the North/South orientation of a typical bar magnet. As well, the different biomagnetic segmentation patterns of the body are also represented.

Subluxation (SDS), as described above.

Clinical evaluation of inappropriate motor expression is initiated by assessing the patient in the prone position. Through this protocol, different phenomena have been observed which are used to determine the type of autonomic neurological response the sensory engram is provoking, which in turn determines the clinical approach of the practitioner. The clinical objective is to verify, *post care*, restoration of appropriate sensory-motor response activity by demonstrating specific assessment findings in the patient:

Post Basic Care Assessment Findings

- Legs equal in length in the horizontal and perpendicular positions.
- Equal (bilateral) muscle tone in the legs and in the paraspinal musculature
- Whole body pulsations synchronized in rhythm and intensity.
- No biomagnetic segmentation polarized North/South or vice-versa on the anterior and posterior sides of the body, with the dividing line being the coronal suture and the tips of the toes.

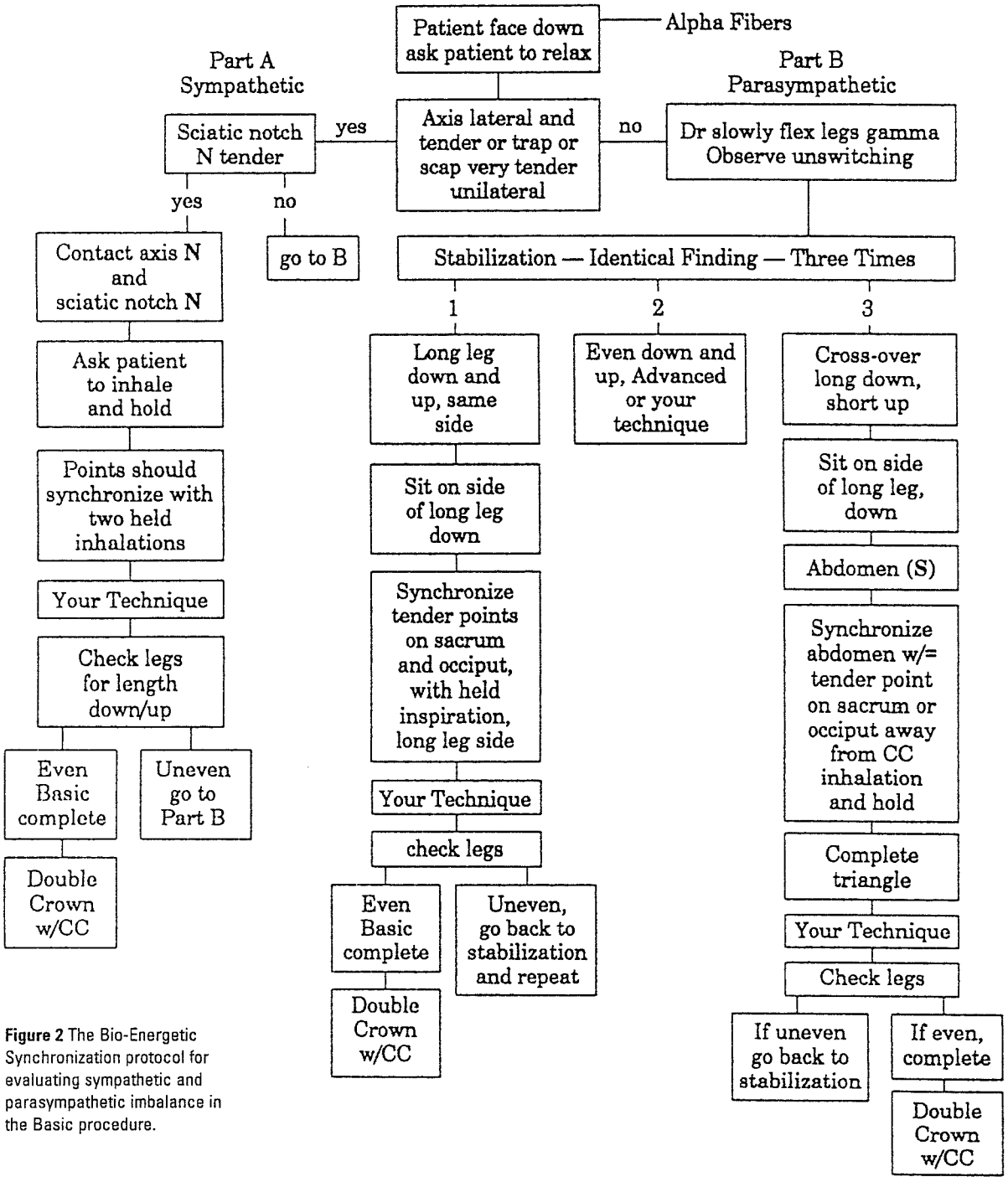

Figure 2 The Bio-Energetic Synchronization protocol for evaluating sympathetic and parasympathetic imbalance in the Basic procedure.

Prone Evaluation

A flow chart depicting the protocol involved in the prone evaluation is shown in Figure 2. The significance of each phase of the protocol is discussed in detail elsewhere.[2]

In the prone position, the patient is asked to consciously relax his/her musculature. The practitioner then palpates for muscular tightness along the paraspinal musculature, moving outward to the larger muscle groups of the extremities.

Excessive Sympathetic Outflow

Increased unilateral muscle tone/tenderness is interpreted as sympathetic predominance, since the muscles cannot be relaxed by conscious control. The muscles reveal a "rope-like" quality on palpation. The increased muscle tone is presumed to reflect an inappropriate hypothalamic-cerebellar outflow or "timing-problem." The tenderness of the musculature is believed to be the result of accumulation of lactic acid due to prolonged increased muscle tone. This finding is often accompanied by dilated pupils, elevated blood pressure, or reports of rapid heart rate.

The Basic Care Protocol

Clinical observations encompassing approximately twenty years have resulted in an approach regarding specific anatomical areas of contact. These areas, discussed in detail elsewhere,[2] have been demonstrated to be the most effective in eliciting assessment findings indicating restoration of appropriate sensory-motor activity.

In addition to the paraspinal musculature, other palpation evaluations may reveal laterality and tenderness over the axis (2nd cervical vertebra) body, and equal tenderness over the vastus lateralis and/or tensor fascia lata. If tenderness is not apparent in these areas of musculature, then the epsilateral sciatic notch is evaluated. Similarly, in the absence of palpatory tenderness of the axis, the practitioner may detect tenderness of the superior border of the trapezius or the musculature overlying the suprascapular spine. Promoted by inappropriate motor outflow derived from sensory engrams, the tenderness of the contact points is likely associated with tendon stretching stimulating the afferent sensory neuron pool which enervates the boney skeleton. The painful areas are also believed to elicit a "guarding" reaction via the golgi tendon apparatus which sustains the inappropriate muscle tone or tension, thus exacerbating the muscle tenderness.

In the presence of excess sympathetic output, the goal of Basic care is to relax the tight muscles. This is accomplished by holding light contacts at specific anatomical locations.[2] The two contacts are held with the magnetic North seeking finger of the respective hands. Once the tenderness associated with these contacts has been resolved, other areas of the dorsal musculature are palpated and assessed for tenderness. If tender areas above and below the diaphragm are detected, then contacts are also made on these areas.

While the practitioner holds the contacts, the patient is asked to hold his/her breath following a full inspiration. During this period, the practitioner notes the pulsations emanating from the contact points. The practitioner holds the contact points until the pulsations felt at the respective points become synchronized. The synchronization is a reflection of the body disrupting the areas of somatic magnetic segmentation. Since the magnetic polarity of the practitioner's fingers is the same as that of the segmented areas of contact, the natural repulsive forces believed to be generated through the contact points rules out energy transmission from the practitioner to the patient. Consequently, the disruption of segmentation more likely reflects a re-organization and utilization of the patient's magnetic field energy to dissipate the segmented condition. When pulse synchronization has occurred, palpation should reveal that the musculature has relaxed with tenderness no longer present.

Pulse synchronization is considered an indication that the biomagnetic segmentation has been diffused. Concomitant with this input, while the patient is holding inspiration, the cortex perceives a non-traumatic warning of anoxia. To conserve oxygen, it is postulated that the brain responds to this perceived warning by selectively lowering the activity of areas of the brain involved in non-critical areas of survival. In consideration of this hypothesis, it is understandable that the practitioner consistently notes a relaxation response in tense musculature. This is likely accomplished through the golgi tendon/gamma motor neuron circuit as the areas of the brain responsible for this muscular state lower their activity and motor output. In instances which have been clinically observed, this same phenomenon is also apparent regarding visceral dysfunctions, which is discussed below under the protocol applied for parasympathetic excess.

It is surmised that the reduction of segmentation and synchronization of pulse, enhances the flow of appropriate sensory information to reach the cortex where it is processed. In this manner, motor activity inappropriate to the circumstances, driven by sensory engrams which resulted in increased muscular tension, is reset through a diminution of cerebellar output reflected in a relaxation of inappropriately tensed musculature. The success of this approach, when considering sympathetic excess, is evaluated by observing the relaxation of the tense musculature, both autonomically, as well as consciously by the patient.

It is at this point in the protocol that procedures associated with other disciplines may be used to affect the outcome, if the practitioner's assessment has indicated a necessity for such intervention. This could include, but not be limited to, such procedures as those offered by practitioners of polarity therapy, acupuncture, massage therapy, chiropractors, osteopaths, and under conservative conditions not involving administration of toxic substances, medical physicians. Correction of conditions specifically addressed by practitioners such as those mentioned above, are likely to be more effective, since the neurophysiological factors which contributed to the inappropriate physiological parameters associated with various maladaptive characteristics are no longer present.

If the legs become balanced (even) when observed parallel to the table, or raised perpendicular to the table by bending at the knee, clinical observations have demonstrated that the practitioner is then able to establish the highest level of coherence of

the sensory/motor activity through the "double crown procedure." In this application, a magnetic North seeking finger and South seeking finger of one hand are placed along the midsagittal suture of the cranium with the coronal plane running between the two fingers. The fingers are positioned such that the magnetic North seeking finger is posterior to the coronal plane and the magnetic South seeking finger is anterior to the coronal plane. Thus the fingers are anterior and posterior on a region of the cranium corresponding to the somesthetic region of the cortex (central sulcus of Rolando) which is situated between the somatomotor and somatosensory areas of the cortex. When this contact is made, the magnetic North seeking finger is placed on the area of chief complaint if it is on the posterior side, or South seeking finger if area of chief complaint is on the abdomen. When the practitioner perceives a synchronization of pulses in the cranial area, the primary area of chief complaint (abdomen or dorsal side of the body) perceived by the patient should disappear. When the clinical objectives thus far described are accomplished, it is concluded that sympathetic excess, elicited through inappropriate timing of sensory engram expression, has been eliminated.

Excessive Parasympathetic Outflow

If the legs are uneven, up and down, the practitioner should consider the patient to possibly be in a state of excessive parasympathetic output.

Other clinical signs which may be associated with excess parasympathetic output include:

- Absence of tenderness of the axis unilaterally.
- Cervical spine musculature exhibits bilateral tension.
- Absence of tenderness of musculature over the sciatic notch.
- Contralateral tenderness over the axis and the sciatic notch (i.e., left axis - right sciatic notch).
- Absence of muscular spasms throughout the back.
- Tender areas on the back that do not resolve.

Moreover, decreased (flaccid) muscle tone detected through prone palpation is interpreted as an indicator of excess parasympathetic output. Clinical observations have shown that there may or may not be pain associated with flaccid musculature. As well, digestive symptoms do not accompany the acute phase of parasympathetic imbalance, but either upper and/or lower digestive symptoms may appear if the condition is chronic. Other indicators of excessive parasympathetic output include secretion of excess saliva, and accelerated lacrimal gland activity.

Basic Care Protocol

In the prone position, the patient is first examined for leg length patterns. The legs are passively flexed up and down until a given pattern is demonstrated on three consecutive flexions of the legs, bent at the knee. This maneuver challenges the gamma motor neuron response, until the legs stabilize relative to one another. One of the following three patterns emerges:

1. Legs uneven. The same leg remains equally long in the up and down position.
2. Legs uneven. The long leg in the down position becomes, the short leg in the up position.
3. Legs even, up and down.

If pattern 1 emerges, the patient is palpated for tenderness in the occipital area and the ipsilateral sacrum. When detected, contacts are made on the long leg side of the patient with the practitioner's magnetic North seeking fingers of the left and right hands. These contacts are held until body pulsations become synchronized in the patient. The same protocol and rationale regarding held inspiration, as described for sympathetic excess, is invoked during this stage of the protocol. While currently lacking an explanation, clinical observations have consistently shown that contacts applied to the short leg side do not elicit tenderness, synchronization of whole body pulsations, nor result in correcting leg length differences.

> As previously described, when appropriate, it is at this stage of administration of Bio-Energetic Synchronization that collaboration with other health disciplines may occur.

However, if the legs are balanced, and other indicators are supportive, the resolution of excessive parasympathetic outflow, following administration of Bio-Energetic Synchronization, is considered successful. The coherence of somatomotor and somatosensory pathways are further evaluated by the double crown procedure, as previously described. When synchronization of the three pulses is achieved, the primary area of sensitivity has also been clinically observed to dissipate.

If pattern 2 prevails, the practitioner palpates for tenderness in the abdominal area, usually found just below the xiphoid process. With the patient in the prone position, the magnetic South seeking palm of the left hand is placed on the sensitive area of the abdomen. The magnetic North seeking first finger of the right hand is then placed either on the occiput or the sacrum, whichever is most distal to the area of the chief presenting complaint (regardless of its nature). When synchronization of body pulsations occurs, if the right hand contact was on the sacrum, it is shifted to the occiput, or vice-versa, until synchronization of pulsations once again occurs. From this point, the same protocol, and criteria for a successful application of Bio-Energetic Synchronization, is followed as described above. If the patient exhibits pattern 3, Advanced Care is indicated.

Duration of Care

Patients are initially seen every day for one week, then three times a week until all Assessment Findings of successful progress, as described above, are present on initial evaluation. The patient is then seen once a week during which time he/she is introduced into Advanced Care.

Advanced Care

While Basic Care involves elimination of somatic segmentation (which is generally associated with the chief complaint as

an effect of neurological interference), the clinical objective of Advanced Care involves updating sensory information to higher neural centers which are proposed to lead to neurological segmentation, viewed as a cause of neurological interference.

Methods and Clinical Objective

Certain indicators may be observed during Basic Care suggesting that neural centers other than those addressed at that level of care are involved. That is, when the chief presenting complaint continues after Basic Care, then Advanced Care is indicated. The lack of leg balance in the prone position following Basic Care, for example, is hypothesized to indicate underlying psychosomatic expression which is recurrent, eliciting periods of either sympathetic output and/or parasympathetic output. This condition is affected by, but not able to be reconciled through, the Basic Care procedures. The condition is, subsequently, postulated to result from engrams stored in the areas of the brain other than the cerebellum, which was addressed through the protocol of Basic Care. The other areas surmised to store engrams are the cortico/thalamic areas and hypothalamus which either stores information, or receives input from the thalamus.

Since different engrams are derived from different types of stimuli (i.e., physical trauma versus anxiety), approaches to achieve resolution of these engrams must also be different. Consequently, the methods of Advanced Care update information to the thalamus. This promotes appropriate output from the hypothalamus which mediates many metabolic and endocrine functions. The methods of Advanced Care are employed to assess for the presence of subconscious engrams, and to evaluate through clinically demonstrated indicators that they have been resolved.

The procedure utilizes a series of non-verbal (inaudible) questions which, if correlated to traumatic events, elicit responses from the patient reminiscent of the initial traumatic event, as the brain evaluates and formulates non-verbal answers to the questions. Then, by having the patient follow the Advanced Care protocol during full inhalation, it is hypothesized that successful updating of subconscious memory engrams can be achieved. Synchronization of pulsation, and other indicators, signifies the successful application of the protocol employed.

> *It is emphasized that Bio-Energetic Synchronization is not psychotherapy. At no time is the patient asked to disclose any personal or emotional event in their lives, (other than through the case history). Personal experiences are not solicited. Moreover, patients are not counseled in regard to the resolution of personal problems. Should they seek such guidance, they are referred to appropriate counseling specialists.*

Protocol

The following procedure is designed to bring resolution to the underlying psychosomatic engrams which are responsible for inappropriate physiology which has been temporarily resolved, or has not been resolved by the Basic Care protocol. This approach has its basis in the repulsive force between the field energy of the practitioner and that of the patient. This action provokes reorganization of the patient's field energy and subsequent dissipation of areas of magnetic polarization. While the ramifications of field energy have been presented in the Introduction, some aspects relative to the clinical application of Advanced Care are briefly interjected in this section. Although the human energy field was first introduced as part of Bio-Energetic Synchronization in 1976,[19] the concept of field energy has been applied through several mind/body approaches to healing. Additionally, biological field energy has been qualitatively demonstrated through Kirlian photography,[15] and quantified as well as characterized non-linearly through the studies of Valerie Hunt.[14,15] The studies of Hunt, in particular, demonstrate that human field energy interacts with the environment and can transact with that of another individual. Furthermore, the work of Hunt correlates changes in field energy with functional integrity of the individuals studied.

Based on this knowledge, and clinical observations of profound changes in patients under Bio-Energetic Synchronization care, a protocol has developed which utilizes the human energy field as an interface through which engrams associated with subcortical areas of the brain can be affected. This is accomplished through the following protocol which is employed in the absence of excessive autonomic nervous system outflow, or in the event that Basic Care has not resolved the "timing problems."

Assessment by Intention

Establishing an inter-relationship with the patient's energy field is accomplished with the practitioner assuming a standing position at the foot end of the supine patient. The practitioner, while observing the patient's leg length, mentally envisions a series of questions, anticipating an inaudible *yes* or *no* answer from the patient. This *yes* or *no* response from the patient, *prompted by intention from the doctor,* similar in construct to the currently recognized technique of non-contact communication referred to as Therapeutic Touch,[34-36] is consistently detected through specific changes in leg length and muscle strength. The purpose of the non-contact intention questioning is to access the patient's biofield through which the body responds physically.

Leg Length Changes

Obtaining a Baseline for Yes Versus No Responses

Clinical observations have revealed that if the practitioner inaudibly requests a *yes* response, the patient will respond by expressing a change in leg length. This may manifest as the right leg shortening relative to the left leg. If a *no* response is requested, the right leg will respond opposite by lengthening relative to the left leg. The response may, however, be the reversed. A baseline patient response, therefore, must be determined each time the practitioner inaudibly asks any one of the series of questions posed to the patient. Prior to, and at intervals throughout the procedure, the practitioner assesses the legs for muscle spasms to insure that natural leg shortening or lengthening is not impeded by spastic muscle contraction.

Muscle Strength Changes

A combination of arm and shoulder strength is tested primarily because the patient can readily visualize change while in the supine position. Also, it offers another indicator in addition to the leg length response. In the manner described above, through intention, the practitioner elicits a *yes* or *no* response from the patient. Also, as with the change in leg length, a base-line must be established before any question in the series is asked, since the base-line response may reverse. That is, strength versus the lack of strength may be a *yes* during one question, but may represent a *no* at a later stage of questioning as the segmentation pattern of the patient change.

Questioning Procedure

Once the *yes* versus *no* base-line has been established, the practitioner proceeds with a series of inaudible intention questions. These questions are designed to elucidate the general area of origin of the engrams eliciting inappropriate physiology. The general areas differentiated are listed below:

a. Chief complaint
b. Conscious memory
c. Subconscious memory which may require clues
d. Viscera (internal organs)
e. Communication between organs (synergy)
f. Emotional state
g. Biofield (energy surrounding the body)
h. Nutritional state

Visual Pathways

Once the general area has been identified, the practitioner advances the patient to the most specific area of concern. With the practitioner observing the legs for changes in length, intention questions regarding the position of the eyes as to right or left, up or down, and eyes open versus eyes closed are posed to the patient. In this regard, the practitioner inaudibly asks the patient if the eyes should be up or down or to the left or right, and if the eyes should be open or closed. These parameters have been chosen in consideration of the following relationships:

> *It is well known that either parasympathetic or sympathetic excess, or stimulation of both aspects of the autonomic nervous system, results in a variety of thoroughly characterized physiological responses in the body. Furthermore, it is surmised that eye movements can be influenced via the reticular formation. This is based on the anatomical relationship between the extraocular muscles responsible for eye movements and motor neurons located in the vestibular nuclei, as well as indirectly from the superior colliculus, both of which receives input from the reticular formation. Since the reticular formation, which is also stimulated via excess sympathetic and parasympathetic activity, appears to be important in organizing fast (saccadic) and smooth (pursuit) eye movements, it is hypothesized that excessive autonomic activity is associated with specific eye movements.*[37]

Since the vestibular nuclei are also associated with motor innervation to the extrinsic eye muscles, it is hypothesized that the brain identifies eye movement in the same direction if the head were turned. Thus asking the patient, through intention, if the eyes should be to the right is equivalent to turning the head to the right. The purpose of establishing left versus right is to provoke the memory areas of the brain to re-create, as closely as possible, the physical position of the patient when the event leading to the sensory engram was experienced. Additionally, if a *yes* response is given by the patient when asked if the eyes should be closed, this is interpreted as a problem within the non-conscious areas of the brain (thalamus and/or hypothalamus), as opposed to a *yes* response to eyes open. This response would be interpreted to indicate a problem at the conscious (cortical areas) level. Once again, the purpose of posing these questions is to determine as closely as possible, the area of the brain in which the engrams are stored.

The protocol, to this point, serves to establish communication with the patient's biofield, and to identify more specifically, the area of concern. When the practitioner identifies a *yes* response, appropriate hand contacts are made to tender areas of the temporal and/or occipital areas of the cranium, as clinical observations have demonstrated that the possible quadrants of sub-cortical segmentation can be resolved through contacts at these areas. When a response has been obtained via changes in leg length and/or changes in arm strength, the practitioner assumes a seated position at the head of the supine patient. In this position, if the patient responded *yes* to the temporal contact, the practitioner places the magnetic North seeking finger of one hand, or both if the contact is to be made bilaterally, on the temporal bone near the region of the greater wing of the sphenoid. If the response is *yes* for contact on the occiput, the practitioner places the magnetic South seeking finger of one hand, or both if the contact is to be made bilaterally, on the occiput. The contact may also involve the temporal bone on one side and the occiput on the other. The areas of contact are often tender upon palpation. Clinical observations have demonstrated that the area of chief complaint should never be contacted as the effect on the patient is one of energy intensification, often resulting in an extreme pain and discomfort.

The practitioner, re-assuming a position at the foot of the patient, or standing to the side to test arm strength, then *audibly* poses specific questions to the patient to focus the area of concern.[2] The patient is asked to *think* about the answer. At no time during this procedure is the patient asked to audibly reveal the details of any event. The practitioner is interested only in the body's *yes* or *no* response to the questions as evidenced through changes in the leg length or arm strength.

When a given question receives a *yes* response, the practitioner moves to a position behind the head of the supine patient and makes the appropriate temporal and/or occipital contact. In this position, the contacts are held while the patient is asked to inhale and hold his/her breath (described under Basic Care) until the pulses synchronize. The patient is asked to exhale, then breath in and out. The pulsation should remain synchronized during the full cycle of respiration. This is interpreted as the body removing the sub-cortical segmentation manifested through the various *yes* responses and the initial asynchronous

pulsations. Tenderness at the contact points should also resolve as the pulses synchronize.

The questioning procedure, accompanied by appropriate contacts, continues until, ideally, there are no longer responses to the specific questioning protocol which suggest further intervention. To conclude the Advance Care session, the practitioner *inaudibly* asks *"am I finished?"* If the answer is *yes,* a second question is posed, *"is there anything else I can do for you today?"* If the answer is *no,* the questioning protocol is ended. At this point the patient is asked to sit up and lie down again. This process initiates the righting reflex and is presumed to activate the cortical and subcortical pathways confirming appropriate neurological response to a current stimulus. However, if the cortical engram is still operating inappropriately, the patient will lapse back into the presenting pattern. When the practitioner considers the session completed, the arms are tested for strength in the absence of any questioning as a secondary confirmation of appropriate neurophysiological response to a current stimulus. In one or both arms test weak, then the cranial contacts are verified and the protocol of inaudible questioning is repeated until the confirmation procedures are positive.

Optional Assessment

Patients under Advanced Care are re-assessed after 3-5 visits, generally encompassing a two week period. If findings suggest lack of resolution of inappropriate expression of sensory engrams at this level of care, the nutritional status of the patient may be a factor.[38,39] While nutritional considerations are an optional component of Bio-Energetic Synchronization, in the absence of nutritional balance, it is believed that aberrant physiology may mask, or inhibit successful progress by the patient.

If the practitioner believes that nutritional imbalance may be a contributing factor to satisfactory patient progress, the Bio-Energetic Synchronization concept of nutritional balance may be considered. In regard to this approach, clinical observations have shown that monitoring urine pH under controlled circumstances may be an indicator of the status of the body's alkaline mineral reserve.[40] If this reserve is inadequate, it is postulated that the body may be deficient in its ability to neutralize non-physiologically produced acids, derived from certain foods. Many of these foods have been identified, as well as those which enhance the body's mineral alkaline reserve.[16] Thus by monitoring urine pH, under appropriate conditions, an indication of the body's balance between diet and mineral alkaline reserve can be evaluated, and corrective measures adopted at the patient's discretion.

In addition, pH testing of the saliva is postulated to reflect the response of the body to neutralize a pH challenge. This is accomplished by having the patient suck on any commercial brand "lozenge," which is acid in nature, in the mouth for a brief period. Under normal circumstances the body will quickly neutralize the acid as demonstrated by testing the saliva with pH paper before and after the challenge. However, it is proposed that if a predominating pattern of inappropriately timed physiology is present, it may, through an expression of sympathetic or parasympathetic predominance, "override" the normal response to the acid challenge. Since an inadequate response to the challenge may reflect an imbalance in alkaline mineral reserve and/or a neurological "override," it is suggested that the results of this optional assessment, be interpreted in concert with findings from the application of Bio-Energetic Synchronization Basic and Advanced Care.

Duration of Care

When the objective of clearing sensory engrams has been achieved, the patient is evaluated on a once a month basis. Generally, patients reach the monthly evaluation period within two months. However, individual variation may alter this time frame considerably depending on the degree of stress in the patient's life. If vertebral subluxation, induced by physical trauma, is apparent, patients receiving Bio-Energetic Synchronization may simultaneously receive subluxation based chiropractic care employing any of the currently acceptable techniques for correction of vertebral subluxation.

Outcomes Assessment and Research

Bio-Energetic Synchronization offers the hypothesis that a body free of inappropriate expression of sensory engrams, and in the absence of physical trauma, should also be free of other expressions of inappropriate physiology. Clinical records and preliminary investigation, to date, suggest that the hypothesis has credence.[2,3] Continuous data regarding various aspects of Bio-Energetic Synchronization are acquired on a regular basis during and at specific follow-up periods of HealthWeek, a program administered by Morter HealthSystem, Inc., at the Morter Clinic in Rogers, Arkansas. During these sessions, standardized questionnaires are also given to patients from the onset and at the end of the four day program, to assess their understanding, satisfaction, and benefits or negative consequences.[3]

As part of an on going research program, continuous monitoring of improved health status reported by patients is under evaluation. Additionally, studies are being designed to elucidate the mechanisms of action associated with its methods and protocols. The information obtained from these endeavors is being used to modify the clinical application of this approach, consistent with the stated clinical goals outlined in this descriptive treatise.

Training

An annual Certification Program is offered at the Morter Clinic in Rogers, Arkansas, and several other centers world wide. During an intensive five day session, practitioners are guided through the Basic and Advanced Care protocols and certified after successful completion of three practical examinations. While numerous practitioners have completed the Basic Care seminar, and others have extended their knowledge through a specialized video program, recognition as a certified Bio-Energetic Synchronization practitioner is acquired only through successful completion of the Certification Program administered through Morter HealthSystem, Inc.

References

1. Morter MT. Bio-energetic synchronization technique. The Digest of Chiro Econ 1975; 18(1): 26.
2. Morter MT. Rationale and evidential basis for the bio-energetic synchronization technique and its clinical application. Morter Health System, Inc. 1000 W. Poplar, Rogers Arkansas.
3. Hawk C, Morter TM. The use of measures of general health status in chiropractic patients: A pilot study. Palmer J of Res 1995; 2 (2): 39-44.
4. Pert CB, Ruff MR, Weber RJ, et al. Neuropeptides and their receptors: A psychosomatic network. J Immunol 1985; 135 (2nd Suppl.): 820s-826s.
5. Hazelbauer GL. Bacterial chemotaxis: Molecular biology of a sensory system. Endeavour 1980; 4: 67.
6. Armstrong PB. Invasiveness of non-malignant cells. In Invasion: Experimental and clinical implications. Mareel M, Calman K, eds. Oxford, U.K: Oxford University Press, 1984.
7. Gerhart JC. The primacy of cell interactions in development. Trends Tenet 1989; 5:233-236.
8. Harland R. Growth factors and mesoderm induction. Trends Genet 1988; 4: 62-63.
9. Slack JMW. From egg to embryo: Determinative events in early development, Cambridge. England: Cambridge University Press, 1983.
10. Morter MT. Bio-energetic synchronization technique. The Digest of Chiro Econ 1976; 18(4):52-55.
11. Hunt VV. Electronic evidence of auras, chakras in UCLA study. Brain/Mind Bulletin 1978; 3(9).
12. Hunt VV. Infinite mind: The science of human vibrations. Malibu, CA: Malibu Publishing Co., 1977.
13. Gerber R. Vibrational Medicine. Santa Fe, New Mexico: Bear & Co., 1988.
14. Kelso JAS. Dynamic Patterns: The self-organization of brain and behavior. Cambridge, MA: The MIT Press, 1995: 228-229.
15. Kirlian S, Kirlian V. Photography and visual observations by means of high frequency currents. Journal of Scientific and Applied Photography 1961; 6: 145-148.
16. Thibodeau GA, Patton KT. Anatomy and Physiology (2nd ed.). Baltimore: Mosby, 1993: 367, 567, 570, 754.
17. Stedman TL. Stedman's Medical Dictionary. Baltimore: Williams & Wilkins (26th ed.), 1995.
18. Palmer BJ. The subluxation specific-the adjustment specific. Davenport: The Palmer School of Chiropractic, 1934 (1986 printing): 496-510.
19. Morter MT. Bio-Energetic Synchronization Technique. The American Chiropractor 1981.
20. Davies SC, Ni C, Fardy J, et al. Magnetic susceptibility mapping of the human thorax using SQUID biomagnetometer. Journal of Medical Engineering and Technology 1994; 18(4): 127-133.
21. Seto A, Kusaka C, Nakazato S, et al. Detection of extraordinary large biomagnetic field strength from human hand during external Qi emission. Acupuncture and Electro-Therapeutics Research 1992; 17(2): 75-94.
22. Payne B. The body magnetic. Soquel, CA: Psycho-Physics Press.
23. Nagawa K. Magnetic field deficiency syndrome and magnetic treatment. Translation of an article appearing in the Japan Medical Journal 1976: 2745, In: Roffey LE. Why magnetic therapy works. Massage Technique (July/August)1993:
24. Azanza MJ, del Moral A. Cell membrane biochemistry and neurobiological approach to biomagetism. Progress in Neurobiology 1994; 44(6): 517-601.
25. Schittenhelm R. Biomagnetic imaging. Digitale Bilddiagnostik 1990; 10(3-4): 76-85.
26. Wolff PH. The role of biological rhythms in early psychological development. Bulletin of the Menninger Clinic 1967; 31: 197-218.
27. Kelso JAS. Dynamic Patterns: The self-organization of Brain and Behavior. Cambridge, MA: The MIT Press, 1995: 103, 47, 111, 244.
28. Lewis M. Time-series analysis of stereotyped movements: Relationship of body-rocking to cardiac activity. American J of Mental Deficiency 1994; 89(1): 287-294.
29. Serway RA, Faughn JS. College physics. Philadelphia: Saunder College Publishing, 1989: 994. 444 - 446, 448, 487.
30. Van der Kolk BA, Van der Hart O. Pierre janet and the breakdown of adaptation in psychological trauma. American J Psychiat 1989; 146: 1530-1540.
31. Van der Kolk BA, Van der Hart O. The intrusive past: The flexibility of memory and the engraving of trauma. American Imago 1991; 48: 425-454.
32. Horowitz M. Stress Response Syndromes. second edition. New York: Jason Aroson, 1978.
33. Guyton AC. Text book of Medical Physiology (7th ed.). Philadelphia: W.B. Saunders, 1986: 640-680.
34. Jonasen AM. Therapeutic touch: A holistic approach to perioperative nursing. Todays OR Nurse 1994; 16 (1): 7-12.
35. Wirth DP, Barrett MJ. Complementary healing therapies. International J of Psychosomatics 1994: 41 (1-4): 61-67.
36. Kneosian CV. Wound healing with noncontact therapeutic touch used as an adjunct therapy. J of Wound, Ostomy, and Continence Nursing 1995; 22 (2): 95-99.
37. Noback CR. The Human Nervous System. New York: McGraw Hill, Inc. 1967: 6,8,9,126, 148, 189.
38. Morter MT. An apple a day? Rogers Arkansas, B.E.S.T. Research, Inc. 1996.
39. Robinson, CH. Proudfit: robinson's normal and therapeutic nutrition. 13th ed. London: The Macmillan Company, 1967.
40. Morter MT. Correlative urinalysis, the body knows best. Rogers, Arkansas: B.E.S.T. Research International, Inc., 1987.