

# ***THE ORIGINAL BOWEN TECHNIQUE***

## *A gentle hands on healing method that effects Autonomic Nervous System as measured by heart rate variability and clinical assessment*

Jo Anne Whitaker, M.D., Patricia P, Gilliam, M.Ed., M.S.N., Douglas B. Seba, Ph.D.

### **Introduction and background**

The Bowen Technique is a simple, yet highly specific, hands-on procedure which has been widely practiced in Australia since its development in the 1950's by Tom Bowen. Introduction and training in this methodology has only been delivered outside Australia since 1986 resulting in approximately 1200 accredited Bowen Practitioners in 30 countries throughout the world. This figure includes the approximate 200 practitioners in the United States. The technique is widely practiced in Europe with a concentration in the United Kingdom of over 350 accredited practitioners. The Bowen technique is currently being used in U.K. hospitals as well as private clinics. (1) This rapid globalization of a non-invasive, cost-effective treatment combined with hundreds of anecdotal reports of beneficial effects for numerous mind-body systems prompted this investigation to evaluate the Bowen Technique and facilitate its addition to the accepted armamentarium of American alternative medicine.

Bowen Technique procedures were initially directed at acute musculoskeletal complaints such as work and sports related injuries. It soon became apparent, however, that these procedures had a demonstrable effect on many chronic medical problems, which include a litany of environmental medical syndromes. These include asthma, hay fever, and various types of headaches and other pains. Psychological effects are also reported by Bowen practitioners and their clients. These effects include increased ability to focus, mood elevation, improved quality of sleep, and improved coping skills. Pritchard (2) reported in a study of 10 healthy college students that following Bowen Therapy, the subjects experienced consistently enhanced positive moods and reduced feelings of tension, fatigue, anger, depression and confusion. The effects of Bowen Therapy on these syndromes have been described as the body's return to a more balanced state of equilibrium (3).

In our clinical practice, we have had the opportunity to observe numerous positive effects following both the basic and more advanced Bowen protocols. Examples of presenting symptoms that have responded to Bowen work are acute and chronic back pain, frozen shoulder, TMJ discomfort and dysfunction, and Tic Douloureux. Sports and work-related symptoms which have improved following Bowen work include runner's knee, tennis elbow, hamstring and rotator cuff injuries. There are specific sets of moves that were developed by Mr. Bowen which address the muscles and connective tissue in each of these areas. Other incidental symptoms that have shown improvement with Bowen work include gastrointestinal reflux, sinus congestion and associated headache pain and bronchoconstriction secondary to allergic response or reactive asthma.

It has been suggested that the Bowen Technique may introduce specific harmonic frequencies to the body systems. Sound and music have been used in healing rituals in all of the world's cultures. In ancient Greece, the relationship between healing and harmonic vibration was the foundation of a school of healing established by Pythagoras. Since that time, there has been speculation that specific frequencies affect particular parts of the body (4).

The resonance model, as interpreted by Linda Edwards, Sylvia Oliva and Jo Anne Whitaker, supports this as an explanation of how the Bowen Technique affects the body. The body is like a fine violin. The healthiest body or the most coveted Stradivarius will not function properly without perfect tuning. The Bowen Technique, like the Stradivarius may be based on resonance. In either case, the energy must be directed to the right spot with the right tension in order to create a vibrational patten that correlates with a specific frequency. Since sound travels through all substances this may explain how the Bowen Technique affects so many areas of the body.

Bowen Therapy complements many other traditional as well as non-traditional treatment modalities. Some other modalities, however, seen to diminish the Bowen effect on the body possibly by disrupting the harmonic frequencies.

The measurement of HRV is a relatively new, non-invasive methodology which can evaluate both cardiac and Autonomic Nervous System (ANS) function. It can be explained as the variation in the beat to beat time interval that shows an accelerating and decelerating oscillation. Measurements are made using R to R time intervals from a single lead ECG that are then converted to data representing the sympathetic and parasympathetic components of the ANS (5).

During the last two decades Heart Rate Variability has been extensively studied in various populations. Significant changes in values or patters of HRV have been reported in cardiac conditions such as hypertension, congestive heart failure, cardiac arrest, and mitral valve abnormalities (6,7,8). Other studies have revealed significant changes in HRV parameters in a variety of non-cardiac populations including fetal distress syndrome, sudden infant death syndrome, brain injury, multiple sclerosis, diabetic neuropathy, drug addiction, obesity (9), homoeopathic medical treatment (10), and a healing touch procedure (11). The ANS is known to have an effect on a multitude of regulatory functions such as cardiac, peripheral vascular, respiratory, reproductive, endocrine, and gastrointestinal system regulation, glycogenolysis, and smooth muscle control, and has been implicated in a wide variety of disorders including autoimmune diseases that affect the musculoskeletal system (12). The body systems and functions affected by the ANS are similar to those affected by treatment with the Bowen Technique. It is this subjective observation by numerous practitioners and anecdotal reports that determined our selection of the autonomic assessment by means of HRV measurement as the methodology for this study. The body systems and functions affected by the ANS and reported to be affected by the Bowen Technique coincide with the focus of the 1997 AAEM meeting which is the Mind/Body Connection in relation to optimal, cost-effective health care.

Our initial experience looking at the autonomic nervous system (ANS) in a normal population before and after a Bowen procedure revealed random, bi-directional shifts in several of the time and frequency domain parameters. This corresponded to some degree with the variation in clinical responses reported in this normal group. The consistent clinical responses observed in a population of fibromyalgia subjects led us to hypothesize that this group which presents with a multitude of signs and symptoms might better test the efficacy of the Bowen Technique and might show a larger or more consistent shift in ANS measures than the random shift observed in our normal population with incidental symptoms. These subjects could also provide more clinical assessment data to follow over the course of repeat treatment and heart rate variability (HRV) measurements. Given the poor results of conventional medical intervention versus the modest success of physical treatment approaches, to test the use of the Bowen Technique on fibromyalgia subjects seemed quite logical, particularly since the use of HRV could give us an objective outcome, separate from our clinical assessment.

In our study, subjects with moderate Primary Fibromyalgia were diagnosed by Sally Marlowe, Rheumatologist, N.P and characterized by the presence of widespread chronic pain and tender points as per criteria for diagnosis by the American College of Rheumatology (13) Marlowe has treated over 1000 fibromyalgia subjects in her Rheumatology practice, which will be used as a resource for future studies.

It has been hypothesized that fibromyalgia is an energy deficient state in the muscle tissues due to reduced circulation. It is known that fibromyalgia subjects convert muscle protein to glucose at an unusually high rate and this has been interpreted as one of the main reasons for pain, aching and fatigue. (14,15,16)

At present there is no ideal conventional medical treatment for fibromyalgia. The use of an antidepressant (such as amitriptyline) or an anti-inflammatory (such as ibuprofen) has yielded poor to moderate results. Mild exercise which includes flexibility work can help alleviate some of the symptoms as well. Also, aquatic exercise, chiropractic care, massage, heat treatments and rest can decrease sensitivity at the tender points to improve stamina, energy and mobility (17).

The senior author of this paper, after personally experiencing and training in the Bowen Technique, has been so impressed with the simplicity of the technique and its wide ranging benefits that she has volunteered to direct an international research effort to scientifically assess its validity. One of the reasons the AAEM was chosen for this presentation is due to the fact that the Bowen Technique, which parallels many of the ideas and techniques of the AAEM, has received a similar response from traditional (allopathic) physicians, that of being summarily dismissed as anecdotal and unscientific.

## **GOALS AND OBJECTIVES**

1. Participants will receive a brief overview of the Bowen Technique.
2. Participants will be shown evidence that the Bowen Technique can affect autonomic functions, using HRV as an example.
3. Participants will learn the types of illnesses that may respond to this simple technique.

## **PRESENTATION DATA**

### **The Bowen Technique**

The bodywork known as the Bowen Technique is based on the principle of "less is more" (18) and consists of small precise moves on specific points of the body which are light and gentle and can be used on the young, fragile and elderly. The Bowen moves are organized into sets with frequent and important pauses between sets to give the body time to equilibrate. The Technique uses movements on specific points on muscles, tendons, and nerves, some of which generate energetic movement and others which block or reflect energetic movement. The targeted area of the body is isolated between blocks, energy is generated in the area as the practitioner moves over the muscle and the energy reverberates between the blocks until the muscle tension in the area is reduced and therefore, relaxed.

In this preliminary study the following Bowen protocol was followed on both the fibromyalgia and normal groups:

Study subjects were placed face down on a standard massage table, head to one side, and arms beside the hips. All moves started from the left side. Four Bowen moves were made on the lower back, bilaterally for a total of eight. The first move is just above the buttocks, the second on the outside of the buttocks, the third at the knee and fourth at mid-thigh. Each side is worked in turn and there is a two-minute wait and move two is repeated. Each move is very specific and lasts only a few seconds. In general, certain fingers and/or the thumb are used to roll tissue over specific points on muscles or tendons. For the bulk of the time the subject is simply lying comfortably with no physical interaction with the practitioner.

A similar set of maneuvers is then followed on the neck and shoulders; there are six moves bilaterally for a total of twelve and two waiting periods of two minutes each. Next the subject is gently turned onto his back and three mover moves are made bilaterally for a total of six, including two waiting periods of

two minutes each. At the conclusion the subject is assisted to a sitting position with legs dangling off the table. The subject is then eased off the table so that both feet touch the floor simultaneously and gently seated in the reclining chair for the second HRV reading. This entire procedure requires about 20 minutes.

There are many other Bowen moves which are specific to a large variety of conditions, and many of these were used on different subjects subsequent to this protocol. However, since there was no previously documented Bowen procedure for fibromyalgia, we felt that the basic protocol described above would be sufficient to determine if the technique had any effects on this condition.

### **Heart Rate Variability**

A single lead ECG was used to evaluate beat to beat variation measured by the time interval between R waves in milliseconds. Skin was prepared by cleaning with alcohol prior to the application of electrode patches. Any lead configuration which generates an adequate R wave amplitude can be used. A standard lead H configuration was preferred which provided adequate amplitude in most subjects.

The subject was seated in a reclining chair in a semi-recumbent position of about 30 degrees vertical as this angle has been reported to be the ideal balance point between sympathetic and parasympathetic dominance (6). A real time ECG was monitored for 5-10 minutes until heart rate stabilized. A rhythm analysis was performed prior to beginning data collection to reveal the presence of any dysrhythmias that would disqualify the person from the study. Subjects had been pre-screened and excluded with any known history of dysrhythmias or diabetes.

Twenty three-minute epochs were used in the HRV protocol and measurements were taken immediately before and immediately following a Bowen treatment. The intervals were analyzed using the Predictor® software program distributed by Arrhythmia Research Technology, Austin, Texas, to generate both time and frequency domain parameters. The time domain parameters include the following measures of central tendency; mean, mode, median, standard deviation from the mean; MSSD, the mean squared successive difference; SDNN, the standard deviation of 5 minutes R to R interval averages; and the PNN50, the total number of normal R to R intervals within a given window of time. The frequency domain analysis yields power spectrum values which represent the sympathetic (LF-low frequency) mixed sympathetic and parasympathetic (MF-mid frequency), and parasympathetic nervous systems (HF-high frequency) respectively.

Twenty-three minute epochs were used in the HRV protocol as a reasonable compromise between the five (or less) minutes needed to get a good frequency domain reading and an ideal 24-hour time domain summary. Actually, both LF and HF can be measured in as little as approximately two minutes. However, in order to standardize different studies comparing short-term HRV, five-minute recordings of a stationary system are preferred unless the nature of the study dictates another design. In this case, we were also interested in the time domain methods, especially the mean, the standard deviation from the mean, and the MSSD, all of which can be used to investigate recordings of short duration. Twenty minutes have been suggested as the minimum time to help discern if there is a change in steady state conditions for a given physiological state (6). In this case, we hypothesized that the Bowen Technique, if effective, would demonstrate a short time change in HRV from subjects in the fibromyalgia group and arbitrarily chose the 23 minute epoch as a reasonable starting point, both from the prior knowledge in the above referenced studies and subject comfort and compliance. We found that just sitting perfectly still in tilted chair for 23 minutes is difficult for many individuals with fibromyalgia.

### **Clinical Assessment**

Each subject was clinically assessed immediately before the initial HRV measurement and again immediately following the second HRV reading. Any change in the perception of fibromyalgia symptoms by the subject was noted and taken at face value. Experienced Bowen practitioners recognise that the technique appears to have a profound effect on the so-called mind/body connection in persons

undergoing a Bowen treatment for the first time, as was the case with all of our study subjects. They will often experience a watershed-type event with feelings of deep emotion or spirituality. We were prepared for this and noted changes not necessarily directly related to fibromyalgia but intriguing nonetheless.

Each person was taken as their own control for clinical assessment and was carefully evaluated pre and post Bowen treatment for changes in their self-reported symptomatology, particularly for changes in pain indexes and perceived energy levels. Expected normal individuals were taken from a cohort of volunteers who were free of any acute or chronic medical diagnosis and considered themselves as healthy and symptom free. This proved deceptive as most reported a change of some type following a Bowen treatment. Also, a few, supposedly in good health, had pathologies that were picked up by clinical assessment or HRV and had to be excluded from the study. They were referred for further work-up.

## **RESULTS**

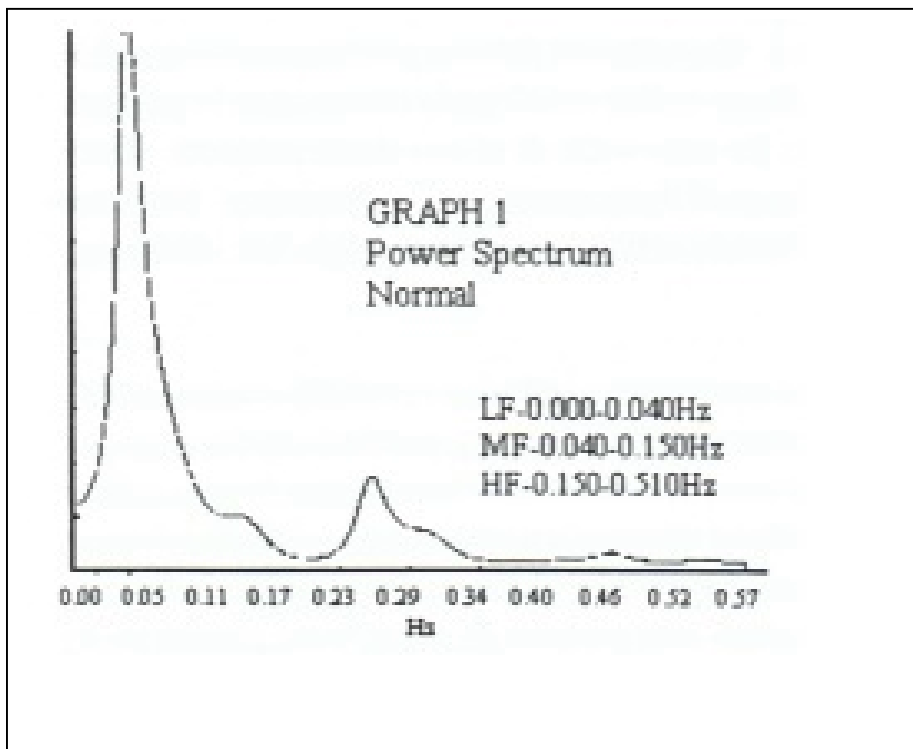
As mentioned above, in the setting for this study and given the small number of subjects available, the use of a true normal group proved elusive. Simply put, most of our apparent normal group, in supposed good health, had minor complaints, many unrecognized until after a Bowen treatment, which responded to this intervention. Thus, the normal group should be considered for what they are, average people with typical minor complaints, and the data interpreted from that perspective. Those study subjects with fibromyalgia can easily serve as their own control since their symptoms are so much more dramatic. We studied 11 individual control subjects and 7 fibromyalgia subjects but 3 of these were used additional times so that we had 11 data sets for each group.

From a clinical assessment point of view, the responses of the individuals in the normal group were widely varied after the Bowen Technique. Some were relaxed while others were energized. Some were mellow while others felt enlightened. Some expressed a little shakiness while others felt a deep emotional block had been released. Many commented that some little annoying pains were suddenly gone. Only two people reported essentially no change in awareness and were probably the only true normal subjects in our study.

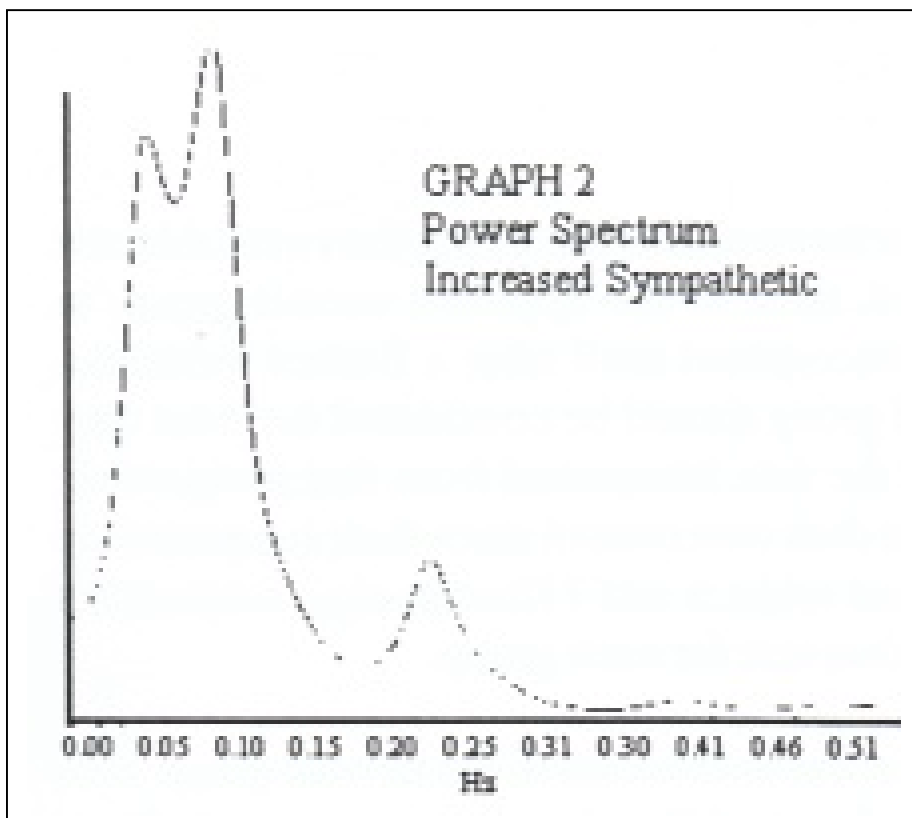
All the fibromyalgia subjects reported at least some relief of their symptoms, and many felt substantial relief. Two things were clearly evident. First, all experienced some immediate relief post-Bowen treatment. Second, this decrease in symptomatology persisted over widely varying time periods ranging from a few days to several weeks. One subject reported that her fibromyalgia symptoms continued to be relieved over a six-week period.

The HRV results fully complimented our clinical assessment. For each subject, three reports are generated for each HRV run. A frequency spectrum, derived from R to R interval distribution, is generally the most useful to visualize shifts in the ANS. This frequency spectrum displays a plot of the three frequency bands, LF (0.000-0.040 Hz), MF (0.040-0.150 Hz), and HF (0.15-0.510Hz). These correspond to the sympathetic mixed sympathetic and parasympathetic, and parasympathetic domains, respectively. For our purposes, most of the spectral power is in the MF which also contains most of the sympathetic spectral power (7). Different studies have divided these bands into various frequencies but the basic concept remains the same.

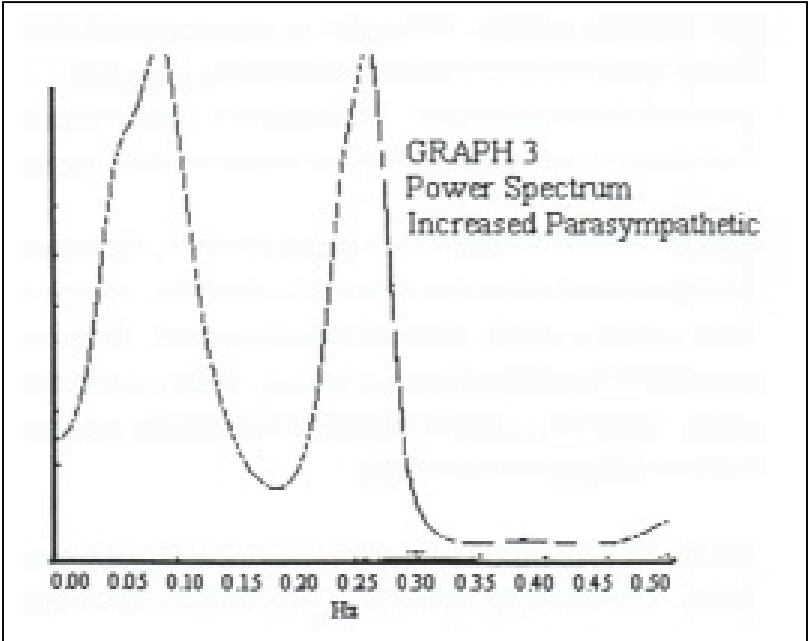
Graph 1 below shows a typical frequency domain graph of an apparently normal individual.



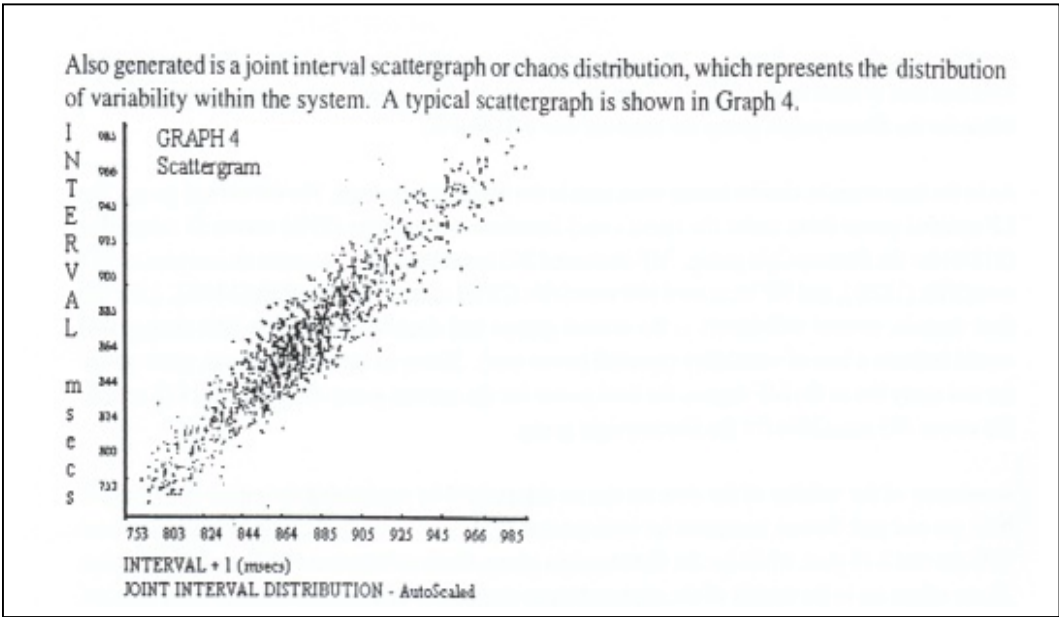
Graph 2 shows an ANS that appears to represent high sympathetic activity.



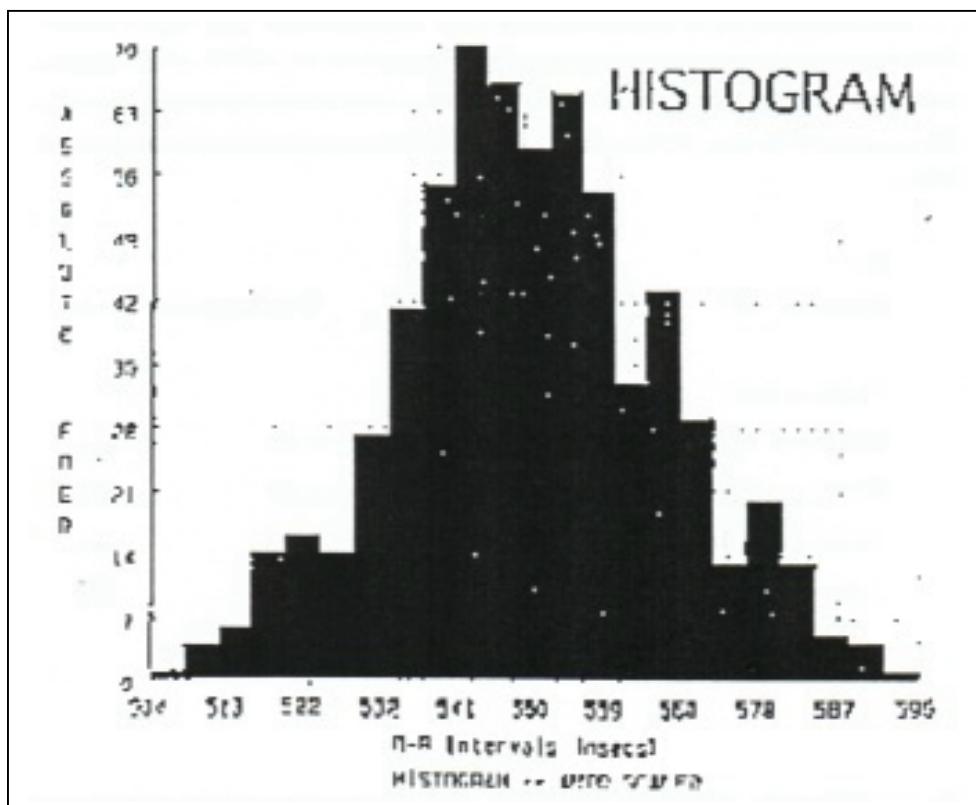
Graph 3 shows in contrast an ANS that appears to represent high parasympathetic activity. Thus, it is apparent that one can tell at a glance if there has been a substantial shift in the balance of ANS.



Also generated is a joint interval scatter graph or chaos distribution, which represents the distribution of variability within the system. A typical scatter graph is shown in Graph 4.



Finally, there is a histogram of R to R intervals generated. A typical histogram is shown in Graph 5 and its shape will change as the balance in ANS is changed.



While these graphs are useful to see changes within an individual, it is the statistical analysis of the cumulative changes in the entire cohort that are reflective of a group response to the Bowen Technique and that is what we report here. The mean increase in the R to R interval for the normal group was 52 milliseconds (msec) or 6% while for the fibromyalgia subjects the numbers were 63 msec or 7%. The difference is that for the normal group, about half had essentially no change or slightly negative numbers which means that their heart rate did not change or increased slightly after the Bowen treatment. This is basically a random change which is what you would expect for a normal group.

In contrast all the fibromyalgia subjects had positive numbers which means that in all cases their heart rate decreased after the Bowen treatment. That, by itself, does not show increased variability. However, this becomes evident when one looks at the increase in the standard deviation. For the normal group, this was 1.5 msec (1.7%) while for the fibromyalgia group this was 11.8 msec (42.0%). This was also evident for the MSSD where the increase for the normal group was only 3.8 (15.5%) while for the fibromyalgia group the increase was 9.0 (44.4%).

As in the time domain, similar trends were seen in the frequency domain. For the normal group, the LF spectral power (area under the curve - auc) increased 3 msec<sup>2</sup>/Hz (29%) versus 38 msec<sup>2</sup>/Hz (211 %) for the fibromyalgia group. MF decreased 243 msec<sup>2</sup>/Hz (-33%) versus an increase of 337 msec<sup>2</sup>/Hz (182%), and HF increased 108 msec<sup>2</sup>/Hz (27%) versus 120 msec<sup>2</sup>/Hz(144%). Like the time domain, several individuals in the normal groups had decreased values or little change that would indicate a loss of variability (spectral power -auc). Since, as mentioned above, most power for our study lies in the MF region, the total power for the normal group changed only 112 msec<sup>2</sup>/ Hz versus 495 msec<sup>2</sup>/Hz for the fibromyalgia group.



A measure of the validity of the data set can be determined by comparing the ratio of MF to HF both pre and post Bowen treatment for both groups. (23) For the normal group, those ratios were 2.03 pre and 2.19 post, while for the fibromyalgia group, these ratios were 2.44 pre and 2.63 post. These values are in the middle of the expected range and help to confirm the validity of our data set. (19)

The two-t (double-tailed) test (used because it is theoretically just as possible that the Bowen Technique would have a negative impact) showed statistical significance at the 99% confidence level for all the time domain parameters defined previously. A Wilcoxon test (non-parametric) also showed similar confidence for all the time domain parameters (19). The values for this fibromyalgia data set are shown in Table 1 below.

	Pre Mean $\pm$ SD	Post Mean $\pm$ SD	Wilcoxon Z	p<
Heart Rate (BPM)	71.91 $\pm$ 7.53	66.88 $\pm$ 7.01		
Mean RR interval (msec.)	843.93 $\pm$ 100.12	907.27 $\pm$ 107.05	2.93	.01
SD (msec.)	30.49 $\pm$ 11.93	42.30 $\pm$ 14.95	2.93	.01
MSSD	19.91 $\pm$ 10.10	28.89 $\pm$ 14.40	2.93	.01
PNN50	3.38 $\pm$ 4.27	10.75 $\pm$ 10.86	2.52	.05

N=11

## DISCUSSION

Our original promise that the Bowen technique would be helpful in alleviating many of the symptoms of fibromyalgia was clearly demonstrated by both clinical assessment and a marked shift in HRV. Clinical assessment, while valid, is always susceptible to the criticism that it is based partially on self-reporting by the subject which could be influenced by a multitude of factors unrelated to the protocol. In this case, the fact that most subjects reported some immediate relief makes it unlikely that an extraneous variable was responsible for this effect. The observation that this relief continued to increase for some subjects over a period of hours would also argue that the effect was real. Finally, this relief of symptoms persisted for a period of days to weeks among the majority of our subjects. All of these changes would indicate that a shift in the ANS balance had occurred.

It is reasonable to expect that a short-term shift in the ANS would be expressed and, could possibly be documented, by HRV assessment. This proved to be the case as demonstrated in 23 minute HRV sampling epochs immediately pre and post Bowen. We conclude that this demonstrates that our clinical assessment of the improvement in fibromyalgia symptoms was valid.

To document the length of time that a Bowen treatment retains its shift or impression on the ANS is difficult by current HRV study techniques. This is because a fundamental shift in the ANS would occur where most of the power is concentrated, the MF, and thus, would be slow to occur. Additionally, over a period of days, there would be circadian and hormonal rhythms to sort out. Lastly, only a small shift at the point of most power could have a profound effect on the ANS but it would take days of sampling to distinguish this from background noise. It may be, however, that

long term shifts in the ANS can be documented by successive short-term HRV studies of the type done here. Conceptually, this can be thought of as a series of snapshots of the ANS over time that could be viewed as the trends toward long-term changes in ANS balance.

As on-going research effort of ours is to perform repeated Bowen treatments and short term HRV studies on the same subject over time to see if we can determine the optimal treatment period for fibromyalgia subjects, as well as treatment periods for other conditions for which Bowen is prescribed. Originally, Mr. Bowen empirically determined that a week between treatments, with a range of five to ten days, was most efficacious. We recognize that the laid-back lifestyle of Australia in the 1940s was considerably different from the urban lifestyle of most people at the end of the millennium. Certainly chemical sensitivity and environmental estrogen mimics would have been rare events. Thus, we feel there is a compelling need to update and individualize treatment schedules for the Bowen Technique.

Likewise, we also feel there is a need to document the value of the Bowen Technique in emergency medicine. There are specific moves reserved for acute and emergent conditions such as asthma attacks, severe migraine headaches, and angina pain which would lend themselves to easy documentation with short-term HRV studies of the ANS balance.

The fact that our normal group turned out to have a variety of responses to the Bowen Technique initially surprised us. In retrospect, this was predictable as most people today are not in perfect health and the Bowen Technique is reputed to beneficially help a wide assortment of conditions. Now recognising this modern reality, we would design future studies using each subject as his or her own control. The fact that few people are truly in perfect health is an important point when designing small, clinical studies in environmental medicine. It does not preclude the use of valid, blinded studies but it does mean that traditional outcome studies based on a comparison of a large number of treated subjects versus a placebo control group is inappropriate. We stress this because we believe that similar studies of the ANS, which can be thought of as a window into the mind/body connection, by short term HRV measurement can be implemented to determine the validity of some environmental medicine techniques which have been rejected by the allopathic medical community such as end point titration or enzyme potentate desensitization.

## **SUMMARY**

The Bowen Technique, a gentle, hands-on method, as used in this study, clearly had a positive health effect, particularly on fibromyalgia subjects. These results were documented by measuring changes in the ANS balance by HRV and clinical assessment. Thus, it is reasonable to conclude that similar studies would support many of the claims made for the Bowen technique. Further, the measurement of shifts in the ANS by HRV studies is a powerful tool and could be used for investigation into other environmental issues.

[www.Bowen-therapie.info](http://www.Bowen-therapie.info)

[www.bowtech.at](http://www.bowtech.at)

## REFERENCES

1. Members of the Bowen Therapy Academy: Northern Hemisphere. (1997). Bowen Hands 6 (1), 16-21
2. Pritchard, A. (1993). The Physiological Effects of the Bowen Technique Therapy, Submitted: Department of Psychophysiology, Swinburne University, Melbourne, Australia.
3. Albrecht, M. (1991). Bowen Technique. *Massage*, 31 May, June, 44-46
4. Goldman, J. (1994). *Healing Sounds*, Element Books, Inc. Rockport, Maryland.
5. Malik, M. & Camm, A.J. eds. (1995). *Heart Rate Variability*. Futura Publishing Company, Inc., Armonk, New York.
6. Task Force of the European Society of Cardiology and the North American Society of Pacing and Electrophysiology. *Heart Rate Variability: Standards of Measurement, Physiological Interpretation and Clinical Use*, *Circulation*. 93: 1043-1065
7. Cowen, M. (1995). Measurement of Heart Rate Variability. *Western Journal of Nursing Research*, 17(1) 32-48.
8. McCraty, R. & Watkins, A. The Autonomic Assessment Report, Presented at the 15<sup>th</sup> Annual International Symposium on Man and His Environment. February 20-23, 1997. Dallas, Texas.
9. Dardik, I. (1996). The Origin of Disease and Health: Heart Waves: The Single Solution to Heart Rate Variability and Ischaemic Preconditioning. *Cycles*, 46(3) 67-77
10. Royal, F., Kullok, S., Royal, D. et.al. Significant Changes in Autonomic Nervous System Activity after the Administration of a Single Dose of Homoeopathic Medicine. Presented at the 15<sup>th</sup> Annual International Symposium on Man and His Environment. February 20-23, 1997. Dallas, Texas.
11. McCraty, R. & Atkinson, M. The Electricity of Touch. Presented at the 15<sup>th</sup> Annual International Symposium on Man and His Environment. February 20-23, 1997. Dallas, Texas.
12. Guyton, A.C. (1991). *Textbook of Medical Physiology*. (8th ed.) W.B. Saunders Company, Philadelphia, PA.
13. Wolfe, F., Smythe, H.A., Yunus, M.B., et.al. (1990). Criteria for the classification of fibromyalgia. Report of the multicentre criteria committee. *Arthritis and Rheumatology*, Vol. 33, 160-172.
14. Toldenberg, D.L. (1990). High Frequency of Fibromyalgia in Patients with Chronic Fatigue Seen in Primary care Practice. *Arthritis and Rheumatology*, Vol. 33.
15. Henrikson, K.G. (1991). Fibromyalgia: A Clinical Entity. *Canadian Journal of Physiology and Pharmacology*, Vol. 69, 672-677.
16. Yunus, M.B. et.al. (1991). Relationship of Clinical Features with Psychological Status in Primary Fibromyalgia. *Arthritis and Rheumatology*, Vol. 34.
17. Hadler, N.M. (1986). A Critical Reappraisal of the Fibrositis Concept. *American Journal of Medicine*, Vol. 81, 26-30.
18. Baker, J. (1996). Less is more. *International Journal of Alternative and Complimentary Medicine*.
19. Atkinson, M. Personal Communication: August 21, 1997.