

Effectiveness of Bowen Therapy in treating Essential Tremor

Aims and Objectives of the project

To evaluate the effectiveness of Bowen Therapy for symptom management of Essential Tremor.

About Essential Tremor

When many think of conditions related to shaking limbs, the immediate thought is Parkinson's Disease. Not as well known, yet 20 times more prevalent, is a condition known as Essential Tremor. (Kavanagh 2014)

Essential tremor is a neurological (nervous system) disorder which causes involuntary shaking or trembling of particular parts of the body. Hand tremor is most common but the head, arms, voice, tongue, legs, and trunk may also be involved or eventually impacted.

Essential Tremor is not the same as Parkinson's Disease. Essential Tremor is always most obvious when the hands are being used (but are stable at rest), whereas in Parkinson's Disease the hands usually shake most when at rest and less when they are being used.

The majority of Essential Tremor sufferers (95%) will show signs of the "action tremor" form (sometimes referred to as kinetic or intention tremor) (Kavanagh 2014) - obvious when performing meaningful actions e.g. holding a cup of tea, bringing it to the mouth, writing or using knife/fork. The tremors typically reduce significantly or stop altogether when the hands are resting.

The other form is "postural tremor", seen if they hold their bodies in certain positions, or when trying to hold a limb against gravity, e.g. arm out in front.

In most people, Essential Tremor is often more embarrassing than disabling, interfering with day to day activities such as carrying items, drinking from a cup, eating, writing, sewing or shaving. However, "in some cases, the sufferer of Essential Tremor may not even be able to hold their hand steady enough to drink from a cup. (Kavanagh 2014)"

Heightened emotion/anxiety or stress is a key trigger to tremor or increased severity - for some, the anxiety of potentially being seen with the tremor can trigger tremors and increase severity.

Although it may be mild and non-progressive in some people, in others the tremor is slowly progressive, starting on one side of the body but eventually affecting both sides and/or gradually get worse over time and with advancing age.

The cause is unknown and there is no cure, although drugs and surgery may help. Older people are most susceptible, but anyone of any age can develop essential tremor – a person can even be born with it.

(National Institute of Neurological Disorders and Stroke (NINDS)) (Parkinson's Victoria 2014)

Demographic statistics

It is estimated that up to 4% of the Australian population aged 40 years and over are affected by Essential Tremor, and up to 14% of people over 65 years. (Kavanagh 2014) It is believed that Essential Tremor may be one of the most common forms of neurological disorders among older individuals.

Essential Tremor may first appear at any age between childhood and old age. However, onset before the age of 10 is considered rare. Most commonly onset is after age 40. (National Tremor Foundation (UK))

Essential Tremor affects men and women equally. It is found in all part of the world, and all races. "No one group of people is more likely to develop ET. (National Tremor Foundation (UK))

Genetics is responsible for causing Essential Tremor in many people with the condition (familial tremor). Each child born to a parent with Essential Tremor will have up to a 50% chance of inheriting the responsible (currently unidentified) gene, although many may never actually experience symptoms. (Fung)

While most sources quote that 50-70% of cases have a family history of essential tremor (Kavanagh 2014), "another study has indicated that in 96 percent of cases, essential tremor may be familial, a result of an autosomal dominant genetic mutation." "Most people, after learning the nature of their problem, are able to trace it from a parent and other family members." (Brody 2007)

Cause

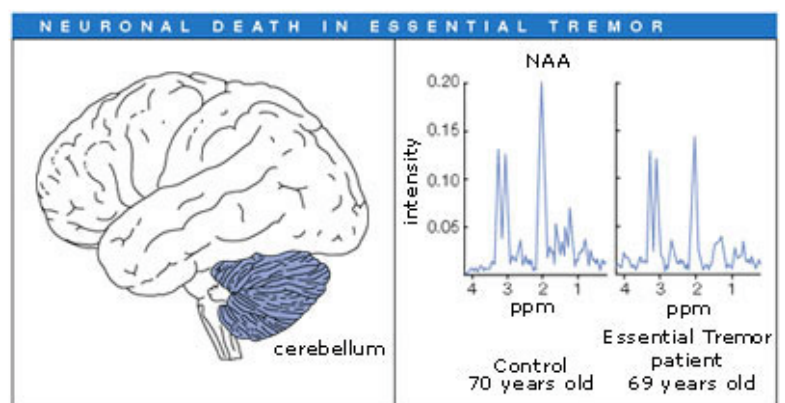
The exact cause of essential tremor is unknown, but "two of the biggest risk factors for developing Essential Tremor are advancing age and a family history. (Kavanagh 2014)"

However essential tremor can develop in people who have no family history of the condition, and causes remain under investigation.

Some research suggests that the part of the brain that controls muscle movements does not work correctly in patients with essential tremor. Tremors are thought to be caused by electrical fluctuations in the brain that send abnormal signals out to the muscles.

"Several areas of the brain have been implicated in generating these abnormal signals. The signals travel through a variety of brain regions before they make it out to muscles. These regions include the cerebellum, thalamus and cortex. Interruption of tremor signals along this pathway may be why thalamic (VIM) stimulation using a surgically implanted device is often effective in treating essential tremor. (Parkinson's Disease and Movement Disorders Center)"

Research indicates that some cells in the cerebellar cortex shrink or disappear in people with the disease. Using proton magnetic resonance spectroscopic imaging (MRSI) the concentration of N-acetyl-aspartate (NAA) inside neurons was measured - a low level is believed to indicate damaged or dying neurons. (Conova 2003)



A new brain scanning study shows that essential tremor may be due to degeneration of neurons in the cortex of cerebellum, left, as indicated by lower levels of a neuronal metabolite, NAA, in the brains of patients, right.

“The researchers measured the amount of NAA in the brains of 16 essential tremor patients and nine controls of similar age. As reported in the Neuroscience Letters paper, the average level of NAA (expressed as the ratio of NAA to creatine) was 20 percent lower in the cerebellar cortex of essential tremor patients than in controls. No other regions showed signs of degeneration. The group also found that the lower the NAA levels, the more severe the tremor, suggesting that degeneration is related to the tremor. (Conova 2003)”

Researchers at Colombia University have established a centralized brain repository that has revealed underlying abnormalities in essential tremor patients. The scientists collect detailed clinical and physiological data on each person, and after death their brains are analyzed and compared with the brains of normal individuals.

“Of the 50 brains studied so far,” “all are degenerative and have very clear pathological changes, although there are several types, suggesting this is probably a family of diseases.” “In about 80 percent of the brains, there are degenerative changes in the cerebellum, including a loss of cells that produce a major inhibitory neurotransmitter called GABA. Other abnormal findings include a messy arrangement of neurofilaments, which may interfere with nerve cell transmission.” (Brody 2009)

Other research has started to identify possible environmental triggers. “Two environmental toxins have been found to be elevated in tremor patients: lead, and a dietary chemical called harmane that occurs naturally in plants and animals.” (Brody 2009)

Beta-carboline alkaloids, found in common foods, are also produced in the body. “Injections of large doses of alkaloids damage cerebellar neurons and induce tremor in animal models of the disease. (Conova 2003)” In the study of 100 essential tremor patients and 100 controls, it was “found that the level of one type of alkaloids (harmane) was two times higher in the blood of patients than the controls, though far lower than the doses used in animal models.” It is thought that “patients may be chronically exposed to higher harmane levels from their diet, metabolize the alkaloid differently, or simply make more of it. (Conova 2003)”

A further study indicates higher blood lead concentration in essential tremor sufferers versus control subjects. “Prevalence of lifetime occupational lead exposure was similar in Essential Tremor patients and controls. We report an association between BPb concentration and Essential Tremor. Whether this association is due to increased exposure to lead or a difference in lead kinetics in Essential Tremor patients requires further investigation.” (Louis et al 2003) Data from a further study “replicate those of a previous study” “and demonstrate an association between the environmental toxicant lead and a common neurologic disorder (Dogu et al 2007)”

Despite the research giving promising leads to understanding causes of essential tremor, none are yet at a point to enable prevention or able to be used for diagnostic purposes.

Diagnosis

Doctors and/or neurologists diagnose Essential Tremor on the basis of the symptoms and a neurological examination.

Because tremor is a feature of many conditions, Essential Tremor can be mistaken for something else. Before diagnosing Essential Tremor, doctors will usually test to rule out other possible causes of tremor (eg. thyroid disease, excessive caffeine ingestion or medication side effects).

There are no blood, urine or other tests for Essential Tremor. A brain scan is not required to diagnose, however doctors may request an MRI or CATscan if there is a suspicion of some other cause of tremor. Essential Tremor does not have associated abnormality on routine scans. (National Tremor Foundation (UK))

Treatment Options

Many people with Essential Tremor choose to continue life untreated once they are reassured that they do not have an alternative disease. (Fung) With adequate knowledge, many people learn ways to live well with Essential Tremor.

Essential Tremor has no cure. The aim of treatment is to suppress the tremors, reduce tremor severity, improve ability to function, and decrease social handicap, through:

- Eliminating or reducing tremor "triggers" such as anxiety or medications.
- Symptomatic drug therapy.
- Physical and occupational therapy may help to reduce tremor and improve coordination.
- Deep brain stimulation or other surgical intervention.

There is no evidence that early treatment stops or slows the natural progression of ET symptoms. (National Tremor Foundation (UK))

Medication

No medication is specifically designed to treat Essential Tremor. For approximately 60 percent of sufferers, medication (single or combination) are seen to benefit in the treatment of its symptoms. (Elble) With oral medication, a 50% reduction of tremor severity is considered good. (National Tremor Foundation (UK))

Certain medications, such as asthma medications, Ritalin or lithium, and any other medications that increase tremor are recommended to be avoided.

Propranolol (Inderal®) is a beta-blocker primarily used for treating high blood pressure. It is not clear exactly how it works in treating essential tremor. 60% of people with Essential Tremor are helped by propranolol. It is mostly used for hand tremor, but may be effective for tremor of the head, voice and tongue. Complete tremor reduction is rare. Other beta-blockers may also be used (eg atenolol, metoprolol, and nadolol). (Elble)

Primidone (Mysoline®) is an epilepsy medicine that was unexpectedly found to reduce tremor, and is now widely used for Essential Tremor. Approximately 60% of people with ET are helped by primidone. (Elble)

If the tremor is not well controlled by propranolol beta-blocker or by primidone alone, better results are said to be seen if both medicines are taken together.

Anti-anxiety/benzodiazepine medications (eg clonazepam (Klonopin), diazepam (Valium), alprazolam (Xanax) or lorazepam (Ativan)) are said to be useful in patients who do not respond to other medications or who have associated anxiety. These drugs are usually less effective than propranolol and primidone. However, side effects include drowsiness, and there is a risk of dependence and withdrawal. (Elble)

Adults with ET often notice that responsibly drinking alcohol – having one or two drinks before social events for example – reduces tremor for one to two hours. (Fung) However, it is noted that drinking is not a good, long term solution for people with essential tremor. Tremors tend to worsen once the effects of alcohol wear off, and larger amounts of alcohol are eventually needed to relieve tremors, which can lead to chronic alcoholism. (Mayo Clinic)

Other emerging anticonvulsant medications such as Gabapentin (Neurontin®) and Topiramate (Topamax®) are tried by patients whose tremor is unmanageable by other medications, and have shown various levels of effectiveness for some sufferers. (Fung)

Botulinum toxin (Botox) injections

Another therapy for cases where medication fails less widely documented on Essential Tremor support sites involves injections of Botox into muscles. The treatment often requires repeat injections, thus is an expensive option not always covered by insurance.

A number of studies have been conducted indicating significant improvement for hand-tremor (75% reported improvement vs 27% placebo).

Botox injections have been said to be more useful in the treatment of head and voice tremors. Further studies indicate positive results (50% had moderate to marked improvement in one study (vs 10% placebo), while another quoted subjective improvements in 100% participants)

Botox impact on voice tremor has been less widely studied. Approximately 25% of patients with Essential Tremor have some level of Essential Voice Tremor (EVT). A small study indicate "about 30% to 50% of EVT patients improve based on objective acoustic analysis, and 65% to 80% of patients improved by subjective assessments."
(Jankovic 2012)

Surgical treatment

In cases where treatment with medications is not effective and ET is very disabling, surgical techniques may be recommended. The most common are deep brain stimulation or thalamotomy.

Deep brain stimulation (DBS) surgery, the most commonly used surgical procedure, is said to be proven to significantly or completely reduce the tremor in 80% of people. A wire is placed in the ventral intermediate nucleus (VIM) nucleus of the thalamus, and connects under the skin to a pacemaker-like device in the chest (below the collarbone) that provides mild electrical currents to control symptoms. By sending electrical currents through the electrode, patients can interrupt communication between tremor cells. Tremor reduction occurs within seconds of activation and can be dramatic. Tremor medications can often be reduced or even stopped.

Thalamotomy is a surgical procedure that destroys part of the thalamus in order to block the abnormal brain activity thought to cause Essential Tremor. Currently, thalamotomy is rarely performed due to the risk of serious side effects and the availability of DBS, which is safer, does not destroy brain tissue and has fewer complications.

Gamma Knife® radiosurgical thalamotomy is a technique in which a thalamotomy is performed with beams of radiation rather than a surgical incision or use of electrodes. This procedure is generally restricted to patients with severe tremor who, because of unstable medical conditions, are not candidates for DBS.
(Lyons 2013)

Non-Conventional Therapies

Literature review finds little mention of treatment of Essential Tremor with alternative or complementary therapies, mostly due to a lack of scientific studies to provide any form of evidence.

Where information is found, it is largely in the area of reduction in stress or anxiety. This may be through relaxation techniques, and/or changing how a person reacts to stressful situations.

Limited information is available for physical or manual therapies.

Stress-reducing therapies

Stress and anxiety tend to make tremors worse, and being relaxed may improve tremors. Although it's not possible eliminate all stress from life, changing reactions to stressful situations using a range of relaxation techniques, such as massage or meditation, are seen to help.

The International Essential Tremor Foundation lists the following as useful ways that some have lessened tremors:

- Mindfulness (Geroux 2012)
- Hypnotherapy (Warfield 2012)
- Tai Chi (International Essential Tremor Foundation 2012)
- yoga

Homeopathic Supplements

Certain herbal remedies are said to be used by some sufferers, although it is recommended only upon consultation with a doctor and a registered naturopath.

Some herbal remedies have side-effects and negative interactions with traditional medications. One especially of note is ma huang (or Ephedrin) which is known to make Essential Tremor worse. St Johns Wort should also not be taken in conjunction with traditional anti-depressants. (Davis 2012)

It is noted in most sources that supplements are only a support, that if sources of stress are not addressed, then supplements may be of minimal help.

Most listed through various sources are herbs believed to be calming, assisting anxiety or stress that may trigger tremors:

- Valerian (popular to promote relaxation, help anxiety)
 - Skullcap (mild relaxant, anti-anxiety, may help relieve convulsions)
 - Passionflower (relaxing, calming, may help seizures)
 - Chamomile
- (Gagnon 2012) (McLelland 2013)

Supplements listed that may help nervous system health include:

- Omega 3 fatty acids (coats myelin of nerves, help keep neurons healthy, reduce inflammation)
 - balanced B complex (supports nerves)
 - Fish oil (improves cell to tissue communication due to Docosahexanoic acid (DHA) content, maintenance of cellular membrane structure and fluidity, decreases inflammation)
 - Isoleucine amino acid (a component of proteins, reduces excitation of nerve fibres)
 - Lecithin (protects the nerve sheaths from degradation and helps electroconductivity of the nerves)
 - Magnesium (improves neuromuscular transmission of signals across the nerve synapses to reduce excessive muscular contraction)
 - CoQ10 (antioxidant, provides lipids to help protect the myelin sheath (electrical conduction), electrical potentiation of nerve signals)
 - Alpha-lipoic acid (improves synthesis of energy within the muscles, antioxidant, reduces neural damage)
- (Gagnon 2012) (James 2012)

Acupuncture

Acupuncture is listed by International Essential Tremor Foundation (IETF) as a potential natural therapy (Donnellan 2012). Positive effects are referenced by some sources (Puschman et al 2011) while only the occasional reference indicates actual results - "total effective rate of 84.6% in the treatment group was better than 61.5% in the control group ($P < 0.05$) and there was less adverse effects in the treatment group. (de la Torre 1989)"

Although it is stated that in Chinese medicine liver controls the sinews and muscles, and most tremors are caused by liver problems (including toxicity from medicine or alcohol), actual treatment is based on the pattern within the individual, rather than the actual condition. (Yin Yang House)

Occupational Therapy

Physical and occupational therapy are said to be helpful in terms of providing suggestions for using adaptive devices, including utensils with larger handles, which are said to give considerable benefit in daily activities. (National Tremor Foundation (UK))

Tremors are said to be reduced in some sufferers by weighting the limb, usually by applying wrist weights. "In a small proportion of patients, this can dampen down the tremor enough to provide some relief or improve functioning. (Parkinson's Disease and Movement Disorders Center)"

A study also suggests that upper limb "resistance training (RT) can reduce tremor amplitude and improve upper limb fine motor control in older adults". (Kavanagh et al 2015)

Bowen Therapy

There are very few references to be found listing Bowen Therapy as a potential treatment for Essential Tremor. A small number of sources list Bowen Therapy as a treatment that may be tried, but with no detail as to its effectiveness (Corrales 2011) (Benign Essential Tremor Info 2008) Similarly, a number of health or tremor related Q&A forums mention Bowen Therapy as an option to try, but with no data as to its effectiveness.

With Bowen Therapy having known impact on anxiety and on neurological conditions, one would expect that improvements may be seen when treating persons with such conditions with Bowen Therapy.

Bowen Therapy

General description, beliefs, evolution

Bowen Therapy (also known as Bowen Technique or Bowtech) is a dynamic system of muscle and connective tissue therapy that was developed by the late Tom Bowen in Geelong, Australia. It is a gentle form of soft tissue therapy that utilises small but measured inputs to the body, stimulating the body to heal itself to provide relief of injuries and other health problems, both acute and chronic.

A Bowen session involves one or more procedures, each of which consists of several sets of moves. Between each set of moves, there is a deliberate pause, allowing the client's body (and nervous system) time to respond before performing further moves.

The practitioner performs moves in very specific locations on muscles, tendons, ligaments or nerves. During the move, nerve receptors are stimulated, sending signals to the autonomic nervous system (ANS), helping to enable a shift from sympathetic (fight/flight) to parasympathetic (rest/repair) and inviting normalisation of joint/muscle/organ function. Thus, Bowen Therapy usually has an impact on the entire body, through this restoration of balance via the ANS.

It is this influence of Bowen Therapy on the nervous system (versus the other positive influences of Bowen on the fascia, meridian or lymphatic systems) that is of primary interest when looking at neurological conditions such as Essential Tremor.

In contrast to many other hands-on therapies, where the practitioner imposes correction on the client, Bowen Therapy allows the body to heal itself with minimal intervention. (Rentsch 2007)

Demographics

The research project was conducted in St Peters, Sydney - a suburb in the eastern side of Sydney's Inner West, bordering the southern end of Sydney City.

The population of St Peters and immediate surrounding suburbs (within approx 5km radius) is approx 250,000 persons (Australian Bureau of Statistics 2013 - Main Statistical Area Structure level).

St Peters (and a number of the immediate surrounding suburbs) fall mostly into Marrickville Council and Sydney City council areas. Of those areas, the breakdown in demographics is:

	<u>Marrickville</u>	<u>Sydney City</u>
Age < 25 years	26%	22%
Age 25-65 years	62%	70%
Age > 65 years	12%	8%
Household - family	65%	40%
Household - single/shared	35%	60%

Both areas are largely "white collar workers" with high labour force participation rates, in line with the 25-65 age demographic. (Australian Bureau of Statistics 2013 - Local Government Area level).

Through Bowen Therapist listings, there are 6 Bowen Therapists operating within a 5km radius of St Peters. A further 4 are city-based, servicing some of the area's city-employed population. (Bowen Association of Australia, Bowtech)

Bowen is gaining increasing acceptance in the local area. Awareness of the therapy is mixed, with approximately half of current client base having not heard of Bowen Therapy prior to scheduling treatment, having found the therapy in looking for solutions to their ailment.

Aims and Objectives of the project

To evaluate the effectiveness of Bowen Therapy for symptom management of Essential Tremor.

Research Method/Strategies

Participants were treated with a course of 3 treatments during the study, approximately weekly, focussing on upper body, shoulder and elbow/wrist, regardless of what other symptoms or postural issues presented.

An attempt was made to provide some level of quantitative data on the effectiveness of treatment, in addition to qualitative feedback.

Key measures were taken before Bowen treatment and after treatment, to assess any change to severity of tremor in two measures:

- Action: Pick up a glass/cup to a normal holding position (ie approx 20-30cm from chest with elbow flexed).

Qualitative measurement: severity of the tremor - from 0 (no tremor) 1 (slight) 2 (small) 3 (medium) 4 (large) 5 (uncontrollable)

- Action: Draw a spiral (if impacting dominant hand)

Qualitative/Visual assessment of drawing: 0 (smooth, no bumps) to 5 (uncontrolled pen, significant "zigzag" pattern)

(Parkinson's Clinic of Eastern Toronto and Movement Disorders Centre 2014)

It was intended that participants would repeat these simple tests on the days following treatment, however this was reliant on participants remembering to do so.

Anecdotal feedback on general feeling of tremor symptoms was requested, as well as monitoring typically troublesome actions (ideally with ratings).

Participants were asked to not change doctor's directions or medication in any way, or make any other specific changes.

No comparative quantitative data was planned to compare with no treatment or placebo treatment.

The Study Sample/Stakeholders

Participants were sought from the local community, recruited mostly via community pages on Facebook.

No specific requirements were stated other than suffering from Essential Tremor.

Participants were treated with 3 weekly treatments, with actual treatment recorded. There was no comparison to untreated participants.

Ethical Considerations

Explanatory notes were provided to participants - on the treatment being used, measures being taken, and request to repeat these measures on the days following.

Client consent was requested in return for the treatments, with confidentiality of identity preserved. This included a level of client history related to the condition, other significant medical issues, including the medication being taken (if any), and whether any formal medical diagnosis was given.

Data Collection - Results

Five (5) subjects were treated as part of the study.

Four (4) subjects had clear, known familial connections (although not all family members had the tremor formally medically diagnosed)

Two (2) had onset of tremor in childhood/teen years, three (3) noted later onset (50's/60's). The age range of participants was 36 to 72 years. One subject was mid-30's, two subjects were mid-50's, two subjects were approximately 70 years.

Three (3) rated the impact on life as mild, one rated it moderate, one rated severe.

All had action tremor in hand, most impacting simple daily tasks such as writing (if writing hand), carrying items (eg cup of tea), and managing cutlery when eating.

Two had a level of postural tremor in hands (coinciding with those whose impact on life was moderate, severe).

Two had postural tremor in the head, one had tremor in the legs. Neither of these were evident in treatment sessions with the persons involved.

The person whose tremor was rated severe suffered action and postural tremor of the hands, as well as tremor of head and legs.

Two were taking regular medication to help control tremors. One subject took medication only when required for work purposes (needing a steady hand for work tasks), otherwise chose to live with the tremors medication-free. Two took no medication, seeing level of tremor as mild, choosing to manage life with the tremor.

Subjects were treated with 3 treatments during the time period August to December 2015.

Treatment in first 1-2 sessions largely involved focus on upper body, shoulder and elbow/wrist, regardless of what other symptoms or postural issues presented. Treatment 3 sometimes included full BRM1, kidney and/or other moves.

It had been intended that participants provide ratings to tremor in the days following treatment, however almost no participant provided consistent recording of results (tremor severity rating or spiral drawing). Thus, results beyond immediate before/after treatment recorded in the session largely relied on anecdotal feedback.

Subject 1

69years old

Symptoms first noted mid-60's. Diagnosed at approx 68years.

Impact on body - mostly R hand (R handed), some L hand impact

Impact on life - mild. Annoyance when trying to hold cup or cutlery. Still able to conduct many tasks, eg building, painting, diy, tennis with occasional frustration.

Medication - propranolol (for essential tremor and blood pressure), indapamide hemihydrate (blood pressure, also a diuretic), zan-extra (blood pressure)

Family history - no other known ET sufferers

Lifestyle - does not drink water, all fluid intake is tea or coffee. Limited alcohol use. While states that not stressed, wakes during night and cannot return to sleep. While would like to see an improvement, is also not willing to adjust lifestyle - no increase in water intake, no reduction in activity (house painting, building, tennis) on day of or day after treatment.

Treatment subject 1	Moves	Anecdotal change in following wk	Severity of tremor			Spiral drawing		
			before	after	change	before	after	change
1	BRM1 (1-2) BRM2 BRM3 elbow/wrist	Claimed no anecdotal change in tremor	2	0	2	2	1	1
2	BRM1 BRM2 pelvic BRM3 elbow/wrist	Claimed no anecdotal change in tremor	2	3	-1	2	5	-3
3	BRM1 BRM2 rhomboids BRM3 elbow/wrist	Claimed no anecdotal change in tremor	4	2	2	1	1	0

In the days following treatment, the subject claimed that there was anecdotally no real improvement in their tremor.

The subject also had soreness in the arm, some back pain, as well as postural issues (significant apparent leg length difference evident at the pelvis) - these were not consistently treated or resolved prior to participation in this study.

Tremor severity ratings

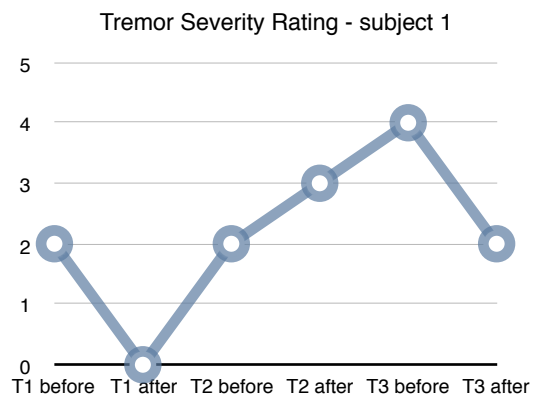
- In two of the treatments, the tremor showed a 2-point improvement (scale of 5) after treatment, while in the other treatment, the subject had a strong reaction in his shoulder, resulting in an increase in severity after treatment.

Spiral drawing

- no consistent trend seen in ability to draw spiral.

Outcome

- No net improvement seen in tremor for this subject.



Subject 2

72 years old

Symptoms first noted mid-50's Diagnosed mid-50's.

Impact on body - mostly L hand (L handed), some R hand impact. Does not appear to be getting worse.

Impact on life - mild. Limitation with actions (eg carrying cup of tea, writing, sewing) but manages via help and workarounds. Tends to not think about it now, but notes that worse when feel sick, anxious or stressed.

Medication - nil (for essential tremor), antidepressants (unstated type), voltaren (arthritis), cholesterol and stomach medication (unstated type)

Family history - son and nephew.

Lifestyle - drinks tea, also plenty of water, not significant amounts of alcohol. Stress not excessive.

Treatment subject 2	Moves	Anecdotal change in following wk	Severity of tremor			Spiral drawing		
			before	after	change	before	after	change
1	BRM1 (1-2) BRM2 BRM3 shoulder elbow/wrist	Noted anecdotal improvement	2	1	1	2	2	0
2	BRM1 (1-2) BRM2 BRM3 shoulder elbow/wrist	Maintained improvement	4	1	3	2	2	0
3	BRM1 (1-2) BRM2 BRM3 elbow/wrist	Maintained improvement	1	0	1	3	2	1

Subject was able to write a few lines legibly after first treatment - after 3 treatments, "I wrote my French dictation, and while it wasn't beautiful, I could keep up and then could read it afterwards" Carrying cups were noted to be easier. Found that could thread a sewing needle (for first time in years).

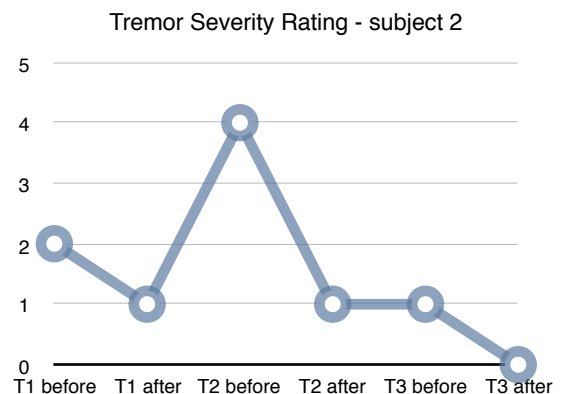
Improvement lasted approx 1 month, at which time it was also noted that stress levels and anxiety had also increased.

Tremor severity ratings

- Subject consistently saw improvements in tremor severity in assessment after treatment. Typically a 1-point improvement was seen, with a 3-point improvement in one session (from a before rating of high tremor).
- Following treatment, tremor severity was rated 0 or 1.

Spiral drawing

- No consistent trend or improvement seen in ability to draw spiral before/after treatment, despite anecdotal improvement in writing ability.



Outcome

- Anecdotal step-change improvement seen within one session.
- Tremor data indicates improvement within 2-3 sessions, with continued anecdotal improvement.
- Improvement appears to have lasted up to a month - but cannot be determined whether increased tremor is loss of bowen impact with time or stress, or both.

Subject 3

36 years old.

Symptoms first noted at 5 years old. Diagnosed at 7 years old.

Impact on body - both hands (L worse, R handed), mostly intentional, also postural. Also impact head, some impact down legs. Significantly worse over past 8 years.

Impact on life - severe. Significant embarrassment in social situations, relying on alcohol to calm hands (and anxiety) enough to control cutlery. Anxiety about being tremors being seen in some situations will trigger increased shakes. Ability to carry out job is being impacted at times, especially ability to type (requires concentration and use of only index fingers). Also has epilepsy (believed to be unrelated to tremor)

Medication - topomax/topiramate (1/day for essential tremor and epilepsy, beta-blockers not worked in past), testosterone (for gender reassignment)

Family history - mother has tremors that increase with stress, but undiagnosed.

Lifestyle - is alcoholic (as result of alcohol use to manage tremor), and drinks approx 2 cups coffee per day. Making effort through study to drink more water.

Treatment subject 3	Moves	Anecdotal change in following wk	Severity of tremor			Spiral drawing		
			before	after	change	before	after	change
1	BRM1 (1-2) BRM2 BRM3 shoulder	No change noted until day 4, then some improvement	2	1	1	2	2	0
2	BRM1 (1-2) BRM2 BRM3 shoulder elbow/wrist	Improvement vs previous week.	1.5	1	0.5	2	1.5	0.5
3	BRM1 BRM2 kidney BRM3 north	Improvement maintained	0	0	0	0.5	0.5	0

After first treatment, noted no real change for the days following. On approx day 4, subject noted a surge in energy/mood and improvement in tremor. Able to type more easily week after treatment.

Following second treatment, noted less tremor, more control - didn't need to think about typing ("amazing"). Able to write legibly. A week after final treatment the subject stated was "still typing like a demon"

Tremor severity ratings

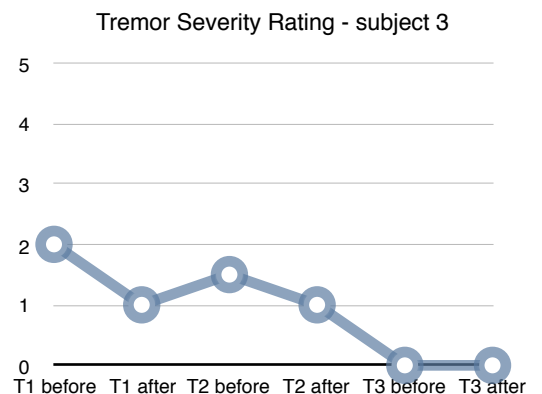
- Improvement in tremor seen within each treatment, and overall improvement over the course of treatments.

Spiral drawing

- No consistent trend or improvement seen in ability to draw spiral within treatment, but improvement seen in hand control (and writing) over the 3 treatments.

Outcome

- Step-change anecdotal improvement seen within two sessions, consistent with tremor severity data.
- Improvement lasted at least 2 weeks after the third treatment, with timing of report writing preventing follow up of how long lasted



Subject 4

56 years old.

Symptoms first noted in early 40's. Diagnosed in early 50's.

Impact on body - L hand (R handed), very low impact in R hand. Some low impact in head and eyes (unfelt in eyes but optometrist can see, head noted only when at dentist when stressed and need keep head still). Feels that slowly getting worse.

Impact on life - mild. Can't carry some items in L hand eg cup of tea, so must carry things in one hand. Stress/anxiety make it worse, even mild stress eg. being given change at supermarket when line is busy, pressure to manage purse quickly increases tremor.

Medication - nil (for essential tremor), aldacatone (blood pressure), another un-stated (hirsutism)

Family history - father has, but undiagnosed.

Lifestyle - healthy, not too stressed, lots water, not so much alcohol

Treatment subject 4	Moves	Anecdotal change in following wk	Severity of tremor			Spiral drawing		
			before	after	change	before	after	change
1	BRM1 (1-2) BRM2 BRM3 shoulder elbow/wrist	Felt hand was calmer, less tremor	2	1	1	n/a	n/a	n/a
2	BRM1 (1-2) BRM2 BRM3 shoulder elbow/wrist	Improvement maintained	0.5	0	0.5	n/a	n/a	n/a
3	BRM1 BRM2 kidney BRM3 elbow/wrist upper trap	Improvement maintained	0	0	0	n/a	n/a	n/a

Anecdotally, the tremor calmed a lot after the first treatment - while tea cup in L hand still not great, a mug was manageable. The subject was able to thread a needle after the second treatment, and was known to show off to family/friends at ability to carry and drink tea without spilling it.

Tremor ratings

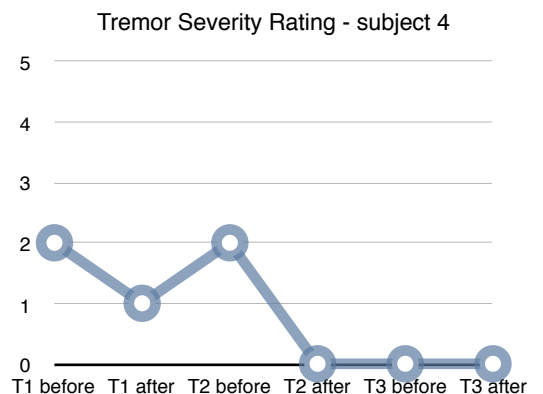
- Tremor improved in each treatment, and was maintained from treatment 2 to end of study.

Spiral drawing

- Writing hand not impacted.

Outcome

- Anecdotal step-change improvement seen within one session.
- Tremor data indicates improvement within 2-3 sessions, with continued anecdotal improvement.
- Improvement lasted at least 2 weeks after the third treatment, with timing of report writing preventing follow up of how long lasted



Subject 5

55 years old.

Symptoms first noted at about 15 years old. Diagnosed at about 15 years old.

Impact on body - both hands. Mostly intentional tremor, but some level of postural tremor also (hands in front).

Impact on life - moderate. Items such as cups can often be held still, but moving the cup often results in loss of control. Actions such as squeezing toothpaste onto toothbrush requires concentration and one hand pressed to bathroom sink. Writing is difficult, with dispensation allowed to type on computer in lieu of writing during study/exams.

Medication - Inderal (for essential tremor - only started 6 months prior, not taking consistently, only when need to have no tremor for nursing tasks). Copper and Zinc supplements prescribed by doctor.

Family history - all father's side of family (father and father's sisters). Subject's sister also.

Lifestyle - generally healthy, lots water. A little alcohol.

Treatment subject 5	Moves	Anecdotal change in following wk	Severity of tremor			Spiral drawing		
			before	after	change	before	after	change
1	BRM1 (1-2) BRM2 BRM3 elbow/wrist	tremor felt worse on day 2 after, then settled to about same as before treatment	2	1.5	0.5	3	3	0
2	BRM1 (1-2) BRM2 BRM3 shoulder elbow/wrist	felt a little less tremor day after, but not felt notable improvement	1.5	1.5	0	2	1	1
3	BRM1 (1-2) BRM2 BRM3 elbow/wrist additional	no data due timing of treatment vs report	3	2	1	3	2	1

The subject's body felt reaction during treatment - on every treatment, generalised increased warmth and tingling was experienced in both hands and both feet, at times to the elbows and knees. However, this reaction did not extend to improving tremor.

Felt minor improvements on day after treatment, but then back to normal.

Tremor severity ratings

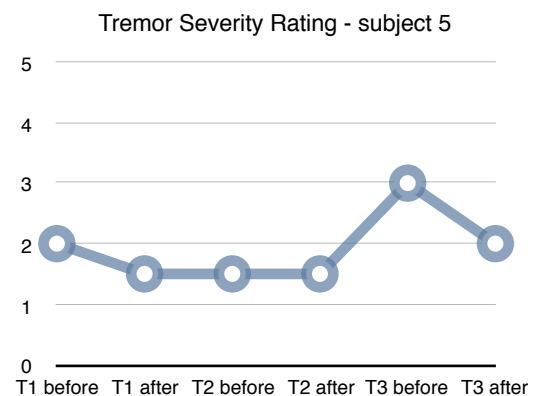
- In two treatments, the tremor showed improvement following treatment.
- Overall, no consistent improvement was noted.

Spiral drawing

- While the ability to draw a spiral improved within treatment, no consistent trend seen.

Outcome -

- No net improvement seen in tremor for this subject. Small improvements lasted only a day or two after treatment.



Data Analysis

Of the 5 subjects that participated in the study:

- 3 felt clear improvement
- 2 felt no sustained improvement

Of those who felt improvement:

- 2 stated anecdotal improvement after the first treatment
- 1 stated improvement after the second treatment

While the number of participants prevents any conclusive statistical analysis, a number of observations were able to be made:

Medication:

- The two subjects that found no sustained improvement were also the only participants that used propranolol beta-blocker in managing their tremor. One subject was taking the medication daily, while the other preferred tremor to medication and took only when needed to for work purposes. Thus, the result may be related to the propensity for propranolol to work on the person, rather than presence of the drug in the person's system.
- The other three subjects who felt improvement were not taking beta-blockers - one knowing that propranolol did not work for them, the other two unknown previously tried medications.
- There may be a link between Bowen Therapy helping tremor and the person's body's response to propranolol beta-blockers for tremor.

Stress/Anxiety:

- The three subjects who found an improvement were also the subjects to actively talk about their tremor worsening with stressful or anxiety-inducing situations.
- The two subjects who did not find an improvement did not notice changes to tremor in stress/ anxiety situations.

Longevity:

- The one subject treated early in the study who noted improvement, stated that the improvement in tremor remained for approximately a month - at this time, the subject also noted increased life stress/anxiety.
- The other two subjects who noted improvement (later in the study) stated that the improvement lasted until the time this report was submitted (at least 2 weeks after treatment).

Anecdotal versus Measured results:

- While two of the subjects felt anecdotal improvement in the week after the first session, the charts documenting "Tremor Severity Rating" did not show improvement until after the second session.
- The Tremor Severity Rating was based only on action of moving cup toward mouth to drink, representing only one common activity that those with tremors find difficult.
- Anecdotal improvement was based on the very personal actions that each person found difficult in their daily life (eg. carrying a cup, threading a needle, typing, writing, putting toothpaste on a toothbrush).

Results show no relation between improvement and age of subject or age of onset of symptoms.

Conclusion

Bowen Therapy is seen to be effective in reducing tremor symptoms for some essential tremor sufferers.

Three of the five participants felt clear improvement in both a tremor severity rating (action of using cup) as well as anecdotal feedback on ability to do daily tasks each specifically finds difficult.

The treatment appears to be particularly useful for essential tremor sufferers whose symptoms worsen with stress or anxiety.

An essential tremor sufferer will know whether Bowen Therapy provides them with improvements within 2-3 treatments.

Further study is required to determine the longevity of the effect, although longevity would be very individual. Initial indications are that improvements are felt for at least 2 weeks, up to 1 month, before maintenance treatment may help.

Sharing Knowledge

Given the high prevalence of Essential Tremor, it remains surprising how relatively unknown the condition is versus the more highly publicised Parkinson's Disease. All subjects felt a level of relief that their problem was being recognised in a small way, but also expressed frustration at the level of research and support of other less prevalent conditions (ie. Parkinson's).

Bowen Therapy to help essential tremor rarely rates a mention in online searches, unlike Bowen for Parkinson's disease which has pages of references. Thus, the challenge is not only in awareness of Bowen Therapy, but also broader awareness of a common disorder.

This report will be summarised into a short format to be shared much more widely in the following areas:

- A blog post will be written, so some data will start to be available in online searches stating benefits of Bowen for Essential Tremor sufferers.
- Following support from Brain Foundation Australia in trying to recruit study participants, information will be shared with this Sydney-based group. To be discussed would be whether information on Bowen Therapy may be included in a future "Brainwaves" newsletter, or through other means.
- The International Essential Tremor Foundation (IETF) includes a section on their website on alternative therapies. They will be contacted to ascertain whether they would also include a page on Bowen Therapy.
- An article for Bowen Hands magazine, to increase awareness of essential tremor.
- other Essential Tremor organisations and websites will be contacted to determine whether an article/blog or other information re: Bowen could be incorporated on their sites.

Participants will also be given a summary that they may be able to share with their GP.

Bibliography

- Australian Bureau of Statistics 2013 "Data by Region - various selected regions" *Australian Bureau of Statistics website*, <http://stat.abs.gov.au/itt/r.jsp?databyregion>
- Benign Essential Tremor Info 2008 "Alternative Therapies", *Benign Essential Tremor Info website*, <http://essentialtremor.webs.com/bowentherapy.htm>
- Bowen Association of Australia "Find a Practitioner", *Bowen Association of Australia website*, <http://www.bowen.org.au/find-a-practitioner/>
- Bowtech "Bowen Practitioner Search", *Bowtech website*, <http://www.bowtech.com/WebsiteProj/Pages/Practitioner/Search.aspx>
- Brody, J 2007 "Finding Some Calm After Living With 'the Shakes'", *New York Times*, http://www.nytimes.com/2007/05/29/health/29brod.html?_r=0
- Brody, J 2009 "Shedding Light on a Tremor Disorder", *New York Times*, <http://www.nytimes.com/2009/12/08/health/08brod.html>
- Conova, S 2003 "Stopping Essential Tremor - New Research begins to track down causes of the disease", *In Vivo*, Vol 2 No 2 29 January 2003, http://www.cumc.columbia.edu/publications/in-vivo/Vol2_Iss02_jan29_03/
- Corrales, C 2011 "Bowen Technique and a MedicinEvolution Perspective on Tremors", *Spikes & Spasms*, Tremor Action Network newsletter, December 2011, <http://tremoraction.org/wp-content/uploads/2013/04/DEC-2011.pdf>
- Davis, M 2012 "Article: Herbal Remedies: Adverse Effects and Drug Interactions", *International Essential Tremor Foundation website*, <http://www.essentialtremor.org/wp-content/uploads/2013/10/Adverse-effects-drug-interactions-of-herbal-remedies.pdf>
- de la Torre, C 1989 "Benign Essential Tremor Resolved with Acupuncture" *Medical Acupuncture*, Vol 1, No 1, Fall/Winter 1989 <http://www.eastwestacupuncture.net/tremor.htm>
- Dogu, O et al 2007 "Elevated Blood Lead Concentrations in Essential Tremor: A Case-Control Study in Mersin, Turkey", *Environmental Health Perspectives*, Vol 115 No 11, August 2007, p1564-1568, <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2072853/>
- Donnellan, C 2012 "Article: Acupuncture in Neurological Conditions", *International Essential Tremor Foundation website*, <http://www.essentialtremor.org/wp-content/uploads/2013/10/Acupuncture-in-neurological-conditions.pdf>
- Elble, R "Treatment Options - Common Medications", *International Essential Tremor Foundation website*, <http://www.essentialtremor.org/treatments/medication/>
- Fung, V "Disorders - Essential Tremor", *Brain Foundation Australia website*, <http://brainfoundation.org.au/disorders/essential-tremor/>
- Gagnon, D 2012 "Natural Remedies for Essential Tremor", *Health Fitness Cafe website*, <http://healthfitnesscafe.blogspot.com.au/2012/03/natural-remedies-for-essential-tremor.html>
- Geroux, M 2012 "Article: Mindfulness and Essential Tremor", *International Essential Tremor Foundation website*, <http://www.essentialtremor.org/wp-content/uploads/2013/10/Mindfulness-ET.pdf>
- International Essential Tremor Foundation 2012 "Article: Coping with Essential Tremor: Tai Chi", *International Essential Tremor Foundation website*, http://www.essentialtremor.org/wp-content/uploads/2013/10/Coping-with-ET_Tai-Chi.pdf
- James, S et al 2012 "FAQ's - Tremors", *Ask a Naturopath website*, <http://www.askanaturopath.com/faqs/tremors/p/425>

Jankovic, J 2012 "Article: Botulinum toxin treatment in tremors", *International Essential Tremor Foundation website*, <http://www.essentialtremor.org/wp-content/uploads/2013/10/Botulinum-toxin-treatment-in-tremors.pdf>

Kavanagh, J 2014 "Essay: Essential Tremor: the most common form of shaking in older adults." *Brain Foundation website*, <http://brainfoundation.org.au/wp-content/uploads/2015/05/Brain-Foundation-Essential-Tremor-essay.pdf>

Kavanagh, J et al 2015 "Researchers proved resistance training benefits dexterity in essential tremor patients", *Journal of Motor Behaviour*, 2015 Apr 29:1-11, <http://www.ncbi.nlm.nih.gov/pubmed/25923582>

Louis, E et al 2003 "Association Between Essential Tremor and Blood Lead Concentration", *Environmental Health Perspectives*, Vol 111 No 14, November 2003, p1707-1711, <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1241711/>

Lyons, K 2013 "Article: Essential Tremor Surgical Options", *International Essential Tremor Foundation website*, <http://www.essentialtremor.org/wp-content/uploads/2013/07/Surgical-Options-050913.pdf>

Mayo Clinic "Diseases and Conditions - Essential Tremor - Lifestyle and home remedies", *Mayo Clinic website*, <http://www.mayoclinic.org/diseases-conditions/essential-tremor/basics/lifestyle-home-remedies/con-20034509>

McLelland, J 2013 "Herbal Remedies for Essential Tremors", *Livestrong website*, <http://www.livestrong.com/article/490375-herbal-remedies-for-essential-tremors/>

National Institute of Neurological Disorders and Stroke (NINDS) "Neurological Diseases & Disorders - Essential Tremor", *BrainFacts org website*, <http://www.brainfacts.org/diseases-disorders/diseases-a-to-z-from-ninds/essential-tremor/>

National Tremor Foundation (UK) "What is Essential Tremor ? - Frequently Asked Questions", *National Tremor Foundation (UK) website*, <http://www.tremor.org.uk/faqs.html>

Parkinson's Clinic of Eastern Toronto and Movement Disorders Centre 2014 "Essential Tremor", *Parkinson's Clinic of Eastern Toronto and Movement Disorders Centre website*, <http://www.parkinsonsclinic.ca/essentialtremor.html>

Parkinson's Disease and Movement Disorders Center "Neurology and Neurosurgery - What is Essential Tremor", *John Hopkins Medicine website*, http://www.hopkinsmedicine.org/neurology_neurosurgery/centers_clinics/movement_disorders/conditions/essential_tremor.html

Parkinson's Victoria 2014 "Conditions and Treatments - Neuromuscular system - Essential Tremor", *Better Health Channel website*, <https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/essential-tremor>

Puschman, A et al 2011 "Diagnosis and Treatment of Common Forms of Tremor", *Seminars in Neurology*, Vol 31, No 1, p65-77, http://www.medscape.com/viewarticle/739106_3

Rentsch, O et al 2007 *Bowtech Training and Instruction Manual, Modules 1 & 2*, Bowtech Australia

Warfield, J 2012 "Article: Hypnotherapy and Essential Tremor", *International Essential Tremor Foundation website*, <http://www.essentialtremor.org/wp-content/uploads/2013/10/Hypnotherapy-ET.pdf>

Yin Hang House "Chinese Herbs and Acupuncture Treatment Protocols for Tremor", *Yin Yang House Chinese Medicine Theory website*, <https://theory.yinyanghouse.com/conditions-treated/alternative-natural-options-for-tremor>