

## **Bowen Therapy for Concussion Resolution in Young Male Athletes: A Case-Series Research Proposal.**

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### Abstract

*Background:* The serious short- and long-term health effects of sports-related concussion in young and older athletes, has recently become a 'hot' topic within sporting organizations, research institutions and the media. Current treatment for concussion - physical, mental and cognitive rest until symptoms resolve of their own accord - does not seem to adequately support full recovery. Research indicates that 80-90% of concussions resolve in 7-10 days, with adolescents typically taking longer to recover. Once diagnosed with concussion, athletes are encouraged to return to play (RTP) as soon as possible and many hide their symptoms due to fear of losing game playing-time, despite not fully recovering. Recent studies indicate that head-related trauma can have serious complications if not properly diagnosed and treated, and repeated head trauma can lead to long-term complications such as dementia and personality disorders later in life. Between 1996 and 2003, a Bowen Therapist in Menlo Park, California, USA conducted a pilot-study on adolescent athletes (n=30) diagnosed with concussion, and applied Bowen Therapy procedures [hereon known as the Concussion Resolution Protocol (CRP)] as a singular therapeutic intervention. Of the (n=33) PCS cases treated, 90.9% of athletes self-reported being asymptomatic and 78.8% were declared medically fit to return to play within 72 hours. Two cases (n=2) took 6 days, and one case (n=1) took 12 days, to recover from PCS symptoms and RTP.

*Objective:* This proposal aims to generate a case-series study that will document the efficacy and rate of recovery in young male athletes diagnosed with concussion, and investigates whether Bowen Therapy, may reliably and consistently decrease PCS symptoms and recovery time needed to begin RTP protocols along with the current standard treatment for concussion injuries.

*Description of Bowen Therapy:* Bowen Therapy (known internationally as Bowenwork and Bowtech) is a gentle, manual neuromuscular technique that facilitates rebalancing and realignment in the body, via relaxation of muscular and connective tissues, fascia, and the nervous system [particularly the Autonomic Nervous system (ANS)] back to a state of homeostasis, in which the body's innate healing mechanisms are activated.

*Participants:* Males aged 14 – 30 years involved in sports programs including (but not limited to) lacrosse, ice-hockey, rugby, football, basketball and baseball.

*Research design:* The authors propose a non-experimental case-series report based on collation of data from participants diagnosed with concussion. Objective and subjective data will be recorded on participants' concussion symptoms pre-CRP and post-CRP by an independent athletic trainer using the sport concussion assessment tool (SCAT 3) and participants' self-reporting of symptoms before and after receiving Bowen Therapy CRP, and rate of return to play (RTP) status.

*Methods:* An independent athletic trainer will conduct a SCAT 3 evaluation on each participant following a suspected head injury to diagnose concussion. Voluntary participants will be referred to Jenna Howe for Bowen Therapy CRP in Victoria, B.C. and Brynn Bicknell in Vancouver, B.C. Participants will be given a questionnaire to subjectively record and rate their symptoms before and after sessions. The nominated Bowen Therapists and athletic trainers will record each participant's date of injury, when the RTP protocol is initiated, and when the player recommences playing sport.

*Results:* The case-series report will reflect a summarization of collated data points on all participants, for the period of the study.

*Conclusion:* This proposal advocates for a case-series study to determine whether Bowen Therapy CRP may impact concussion symptoms and expedite safe RTP for players who have sustained concussion injuries.

*Keywords:* *Sports-related concussion, Bowen Therapy Concussion Resolution Protocol, Youth athletes.*

### Introduction:

Concern about the critical health problems resulting from sports-related concussion injuries, and the apparent lack of therapeutic interventions other than 'rest and wait' has become a current 'hot-topic' in sports medicine and the media. Recent events such as the American National Football League's (NFL) large financial settlement with ex-NFL player claimants suffering chronic traumatic encephalopathy (CTE) as a result of brain injuries sustained whilst playing NFL football, highlight the need to minimize occurrence of, identify and treat concussion more efficiently, and monitor the long term effects of people affected by concussion ([www.nfl.com](http://www.nfl.com), 2014).

Concussion can be defined as "a complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces" (McCrory et al, 2013). It is a form of mild traumatic brain injury (mTBI) with elusive sequelae that may manifest as combinations of clinical symptoms, neurocognitive changes and impairment, and aberrant neurobehavioral phenomena.

Concussion tends to affect functional operations, rather than structural injuries to the brain and nervous system (Makdissi, Davis & McCrory, 2014). Diagnosing and monitoring of concussion recovery varies greatly as there is no consensus on diagnostic inclusion criteria, method or tool used for diagnosis, or prognosis of concussion (Toledo et al., 2012; McLeod & Leach, 2012). Current methods and tools

used to diagnose a person with concussion, and declaring him/her fit for RTP include (among many): SCAT 3, pre- and post-concussion questionnaires, cognitive/psychological testing, post-concussion scale: ImPACT®, the King-Devick test, neuro-imaging such as computerized tomography (CT-Scan), functional magnetic resonance imaging (fMRI), perfusion imaging (arterial spin labeling perfusion MRI), magnetic resonance elastography (MRE), and morphometric imaging of the grey and white matter integrity such as – diffusion weighted imagery (DWI) (McLeod & Leach, 2012).

The conventional concussion treatment protocol is: physical, mental and cognitive rest until symptoms resolve. On average, 80-90% of athletes diagnosed with concussion recover within 7-10 days, however, adolescents may have longer recovery times (14 days or longer) depending on whether they hit their heads on stationary or moving objects (McCrea et al., 2013; Shetty et al., 2014). Athletes are encouraged to get back to game play as quickly as possible, and may hide or deny symptoms because they are afraid of losing valuable playing time, without having fully recovered. In a Post-Concussion Assessment and Cognitive Testing study, Sandel et al. (2012) found that 58% of young athletes reporting on their subjective perceptions of recovery from concussion symptoms were incongruent with objective neurocognitive measures. Cournoyer and Tripp (2014) found that 46% of US high school and varsity football players did not have appropriate knowledge of concussion or consequences of returning to play whilst still symptomatic, highlighting the concern about when a person diagnosed with concussion has recovered and is declared fit to RTP.

Bowen Therapy is an emerging, gentle, manual neuromuscular technique that facilitates rebalancing and realignment in the body, via relaxation of muscular and connective tissues, fascia, and the nervous system [particularly the Autonomic Nervous system (ANS)] back to a state of homeostasis, and facilitating the body's innate healing mechanisms. It is typically performed with the client lying on a massage table, wearing light, loose clothing and the practitioner applying “rolling moves” over specific soft-tissue anatomical locations. The moves trigger proprioceptive responses in the local tissues, spinal reflexes and brain cortex resulting in resetting dysfunctional tissue tension patterns, and shifting the ANS from sympathetic dominance to parasympathetic dominance. Sets of moves are applied, interspersed with 2 minutes or longer ‘hands-off’ periods to allow the body to integrate and respond to the effects of the moves. The practitioner continues working with the concussion client in this manner for about 45 – 60 minutes, applying specific sets of procedures known as the CRP, for supporting the body in recovering from injuries such as concussion. There are no known adverse side-effects of the technique, and it is generally safe for people of all ages, from babies to the elderly. A cautionary contra-indication is recommended for persons who have had surgery on the mandibular condyle of the jaw joint. Whilst there are no specific cases recorded – it is understood that the Bowen Therapy moves directly over the jaw joint may have the potential to alter a person's bite alignment due to relaxation of the soft-tissues and musculature around the temporo-mandibular joint (TMJ) hence the precaution to not perform the TMJ procedure on a person who has had mandibular

condyle surgery. (This does not apply to people who have had jaw bone injuries, orthodontic braces applied, or other dental work).

Between 1996 and 2003, Craig Mattimoe (2005), a Bowen Therapy practitioner in Menlo Park, California, USA conducted a non-experimental pilot-study on 30 volunteer adolescent athletes diagnosed with concussion, aged 15-29 (5 females, 25 males) and applied the Bowen Therapy Concussion Resolution Protocol (CRP) as a singular therapeutic intervention. 30 athletes were treated once, however, there were a total of 33 PCS cases as 1 athlete had 2 concussion episodes and was treated twice and another athlete had 3 concussion episodes and received 3 treatments over the time of the study, accounting for 33 cases. Mattimoe's data showed that of the cases (n=33) treated with CRP, 90.9% self-reported as being asymptomatic within 72 hours or less, and 78.8 % were asymptomatic and medically cleared within 72 hours. One PCS case with the longest lingering symptoms took 12 days to recover. (Note: this study preceded the current 6-stage RTP protocols now used by most athletic trainers and coaches).

Between 2003 and 2014 Jenna Howe (certified Bowen Therapist in Victoria, B.C.) applied the Bowen Therapy Concussion Resolution Protocol to a variety of concussion cases both chronic and acute in nature. When reviewing cases that replicated Craig Mattimoe's demographics, the findings were such that 88.8% of individuals were symptom free in 72 hours or less after application of the CRP.

#### Literature Review:

A literature review in databases Google Scholar and PubMed, using the terms concussion, concussion assessment, concussion management, youth/adolescent sports, yielded hundreds of studies on the incidence of concussion in sports-playing youth, multiple clinical and non-clinical assessments and diagnostic approaches, and protocols for determining when players are fit to RTP, and no peer-reviewed research published on using Bowen Therapy, Bowen Technique or Bowenwork as a therapeutic intervention for concussion management. Anecdotal evidence and reports of using Bowen Therapy for brain injuries and concussion resolution have been documented in non-peer review journals, newsletters and videos. E.g., Stephen Stamp's (2011) article on Insidelacrosse.com on lacrosse player, Nathan White's recovery from concussion after receiving Bowen Therapy. Mattimoe's 2005 report was published in *Bowen Hands*, a non-peer-review journal for international Bowen Therapy practitioners.

#### Objective of the study:

Given the lack of published research on Bowen Therapy and concussion resolution, the authors propose an initial non-experimental case-series report to build a body of knowledge on the subject and assess the feasibility of creating further, more sophisticated controlled experimental studies to determine if Bowen Therapy CRP can demonstrate reliability and consistency in decreasing concussion recovery time prior to RTP protocols. If a safe, non-invasive, non-pharmaceutical treatment is available, then athletes may be less likely to hide symptoms from parents and

coaches, and reduce further brain injury sequelae in young athletes who continue to play with concussion symptoms, despite the associated long-term dangers of acquiring post-concussion syndrome (PCS) and CTE.

#### Research Methods:

*Design:* A prospective case-series report will be created using objective and subjective data recorded on participants diagnosed with concussion, symptoms pre-CRP and post-CRP by an independent athletic trainer using the sport concussion assessment tool #3 (SCAT 3), and participants' self-reporting questionnaires of symptoms before and after receiving Bowen Therapy CRP, and the rate of return to play (RTP) status.

*Methods:* An independent athletic trainer, qualified to diagnose concussion using a SCAT 3 assessment (see: <http://www.sportconcussionlibrary.com/content/sport-concussion-assessment-tool-3-scat3>), will conduct an evaluation on each participant following a suspected head injury. Voluntary participants will be referred to researchers Jenna Howe ([www.concussionresolution.com](http://www.concussionresolution.com)) or to Brynn Bicknell for Bowen Therapy CRP. Participants will be given a questionnaire to subjectively record and rate their symptoms before and after 2 Bowen Therapy CRP sessions, scheduled 7 days apart. The Bowen Therapist and athletic trainer will record each participant's date of injury, when the RTP protocol is initiated, and when the player recommences playing sport. Additionally, athletes diagnosed with concussion will continue to follow the current medical treatment of wait and rest from physical and mental exertion, until deemed fit to RTP by the athletic trainer.

*Participants:* For the purpose of this community-based study, participants recruited will be males aged 14-30 years sourced from various sporting teams in the Victoria and Vancouver, B.C. areas. A cover letter (Appendix 1) and a Concussion Guideline handout (Appendix 2) accompanying this proposal, will invite coaches, athletic trainers, male youth athletes and parents from all sporting teams to nominate eligible participants. Persons identified with concussion will be invited to volunteer as participants in the study. Each participant will receive a SCAT 3 assessment from a qualified athletic trainer and ideally, Bowen Therapy CRP session on the same day, or within 48 hours post-injury, and then a follow up SCAT 3 assessment one week later. Additionally the Bowen Therapy practitioner will ask each participant to fill out a concussion symptoms questionnaire (Appendix 3) in which they rate and record their symptoms pre-CRP and post-CRP 24, 48 & 72 hours later.

*Participant confidentiality:* Participants' names and data will be coded to protect and conceal each person's health data, and no personal information identifying a participant will be made public. Consent will be obtained by inviting each participant to voluntarily sign a formal consent form (Appendix 4), which outlines the research proposal protocol. If participants are younger than 16 years old, a parent or guardian will be asked to co-sign the consent form. All persons meeting the participant demographic will be eligible to participate in the study. Participants who wish to participate but have previously had mandibular condyle surgery will be offered Bowen Therapy CRP without the TMJ moves, and asked to complete the symptoms

questionnaire 24, 48 & 72 hours after being diagnosed with concussion, receiving Bowen Therapy, and have their RTP status recorded.

As this is a non-experimental observational study, the principal investigators are not required to obtain consent or supervision from an institutional ethics review board.

*Study time-frame:* It is anticipated that this study will span from October 2014 to June 2015.

*Method of applying the therapeutic intervention:* Participants will be asked to attend the professional office of Jenna Howe, certified Bowen Therapy practitioner at: Rejuvenation, 4520 West Saanich Road, Victoria, BC, V8Z 3G4, Phone: 250-216-3353, or Brynn Bicknell (address TBA) 778-977-4512 in Vancouver, BC. Participants will receive the Bowen Therapy CRP whilst lying on a massage table, wearing light loose clothing. Each session will last approximately 45 minutes – 1 hour.

*Funding:* Participants will be asked to pay a one-time \$20 to receive the SCAT 3 assessments and Bowen Therapy CRP, to cover office and administrative costs for recording and storing data and communicating with participants by phone, text-messages or emails; follow up after the assessments and CRP protocol; and to determine when an athlete is deemed fit to RTP. The athletic trainer, Bowen Therapy practitioner and authors of the case-series report will be volunteering their time.

*Assessment Tools:* The SCAT 3 is currently the most widely used form of testing in Canada and is recommended by the International Consensus of Sport Concussion (McCroory et al., 2013). An athletic trainer qualified in conducting SCAT 3 assessments will conduct the SCAT 3 assessment on participants before and after Bowen Therapy CRP sessions. The Bowen Therapist will conduct an interview and assessment of each participant prior to the Bowen Therapy session, and participants will complete a symptoms (scaled from 1-6) questionnaire recording their symptoms pre-CRP and post-CRP 24, 48 & 72 hours later. Each participant will be given the same assessment questionnaires and Bowen Therapy CRP. The same Bowen Therapy practitioners will apply the CRP in both sessions, to maintain consistency. In an effort to minimise research bias, the athletic trainer, not trained in Bowen Therapy, will conduct the pre- and post- Bowen Therapy SCAT 3 assessments.

*Data analysis and results:* Data will be collated on participants' pre- and post- SCAT 3 assessment scores; pre- and post -Bowen Therapy CRP questionnaire information; date of initiating RTP protocol (determined by participants athletic trainers and/or coaches) and date of RTP in a sports game. The authors aspire to report on the results of the study (in text and graphic formats) and seek publication in a peer-review medical and or professional sports journal.

#### Discussion:

Case-series reports are generally considered 'low-level research evidence'. As non-experimental studies, they do not attempt to provide comparative data for statistical

analysis, rather, they serve as pioneering endeavours to study a phenomenon and explore the potential for further experimental, clinical research. In this case, anecdotal reports of Bowen Therapy CRP having positive effects on resolving concussion symptoms and expediting athletes' RTP time, with no negative side-effects, have been reported by various Bowen Therapy practitioners around the world. The principal investigators of this study intend to conduct a more formal and clearly documented case-series study, using Bowen Therapy CRP on young male athletes as the only therapeutic intervention, as a primary benchmark in the field of concussion research. Narrowing the eligible participants to male athletes, helps to reduce potential gender variables in response and recovery rates, and it is hoped that similar ongoing studies will include female athletes. Limitations of the study, for generating a case-series report are that data will be very generalized, and there will not be a control group for comparison, other than the current concussion protocol of wait and rest, for the general population.

#### Conclusion:

Given the heightened attention that sports-related concussion is receiving in recent years by athletes, coaches, parents, medical professionals and sporting organizations, and the apparent lack of therapeutic treatment options, other than wait and rest, there is a great need to investigate safe, therapeutic interventions that may reduce acute concussion symptoms and longer term complications of PCS and CTE. Whilst correlation does not equal causation, positive anecdotal reports of Bowen Therapy practitioners using the technique, and data supplied by Mattimoe's study, have inspired this study's principal investigators to establish a foundation for further research on using Bowen Therapy CRP as an affordable, effective therapeutic intervention for concussion resolution.

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Appendix 1: Jenna Howe's cover letter



Rejeneration  
4520 West Saanich Road  
Victoria, BC, V8Z 3G4  
250-216-3353

Dear Friends, Athletes, Coaches, Trainers, Parents and Allied Health Professionals:  
I am excited to announce that Sandra Gustafson, Brynn Bicknell and I, are launching a research project to study the effects of Bowen Therapy on resolving concussion symptoms. While this bodywork technique is relatively unknown, the use of Bowen Therapy for treatment of concussion symptoms has been ongoing since approximately 1995. Craig Mattimoe's independent research showed that 90% of athletes he treated were medically cleared to play within 72 hours or less. The remaining 10% cleared within the week.

I have been practicing Bowen Therapy since 2002 and experienced working with my first concussion case in 2003. Since then, I have worked on clients with varying levels of concussion symptoms and post-concussion syndrome (PCS). When I was asked to review my records and compare results, using the same demographic and Bowen Therapy protocol as Craig, I found that there was an 88.8% resolution of all symptoms within 72 hours or less. Please note, that medical clearance now requires a 6-stage Return to Play protocol.

There are many symptoms associated with concussions: headache, dizziness, nausea, "foggy" feeling, loss of coordination and balance, fatigue, concentration issues and many more. Current research (regarding treatment) states that 80-90% of concussions will clear on their own in 7-10 days without intervention. During this time frame there must be full rest from all physical, cognitive and mental exertion. This requires the athlete to refrain from practice, academics, and all screen-time until symptoms resolve, as all of these activities can prolong the recovery time and/or make symptoms worse. For the concussed individual this can be quite distressing. Resting and waiting, along with Bowen Therapy (a gentle, non-invasive, relaxation technique) have shown to consistently and dramatically reduce concussion recovery time.

The purpose of this study is to create a case series report and build a strong foundation for future research. We are looking for male participants aged 14-30yrs in both Victoria and Vancouver. Each individual will receive a SCAT 3 assessment from an athletic therapist followed by the Bowen Therapy Concussion Resolution Protocol administered by a qualified Bowen Therapist and will be required to complete a take home symptom checklist and return in 7 days to repeat the SCAT 3 assessment, and (if needed) a follow up treatment. At no time will participants be turned away

including younger athletes, older athletes and female athletes, as this information can (with permission) be stored and used at a later date for other research projects. Individuals from all sports are welcome, and we will include people with concussions sustained from other sources.

There is a nominal fee required to participate. All Bowen Therapists and Athletic Therapists are volunteering their time and skills towards the development of this project, and a one time \$20 per person fee will cover administration costs, assessments and Bowen Therapy treatments.

For more information about how Bowen Therapy has helped individuals recover from post-concussion symptoms please explore: [www.concussionresolution.com](http://www.concussionresolution.com). For more information, participation details, and any questions you may have please feel free to contact Jenna Howe ([2rejuvenate@gmail.com](mailto:2rejuvenate@gmail.com), 250-216-3353) in Victoria or Brynn Bicknell ([brynnbicknell@gmail.com](mailto:brynnbicknell@gmail.com), 778-977-4512) in Vancouver.

Attached, you will find a copy of the research proposal for your review and we encourage you to forward this letter and proposal to anyone you think may benefit or would like to contribute in some way.

Thank you,

**Jenna Howe** BA Psych.  
Certified Bowen Health Therapist  
Concussion Health Therapist

Appendix 2: Concussion Guideline handout:



**CONCUSSION:  
GUIDELINES FOR PATIENTS, FAMILY MEMBERS & CAREGIVERS**

***What is a concussion?***

A concussion is a brain injury that causes alteration in the way an individual thinks and remembers things, and can cause a variety of symptoms. A concussion cannot be seen on x-rays or CT Scans.

***What are the symptoms and signs of concussion?***

*It is important to know that the individual does not need to be knocked out (lose consciousness) to have had a concussion.* A variety of problems may happen after a concussion, including:

<b><u>Thinking Problems</u></b>	<b><u>Complaints</u></b>	<b><u>Other Problems</u></b>
<div style="border: 1px solid black; padding: 5px;"> <p>May not know time, date, place, details of their circumstance</p> <ul style="list-style-type: none"> <li>• General confusion</li> <li>• Cannot remember things that happened before and after the injury</li> <li>• Knocked out</li> </ul> </div>	<div style="border: 1px solid black; padding: 5px;"> <ul style="list-style-type: none"> <li>• Headache</li> <li>• Dizziness</li> <li>• Feels dazed</li> <li>• Feels “dinged” or stunned; “having my bell rung”</li> <li>• Sees stars, flashing lights</li> <li>• Ringing in the ears</li> <li>• Sleepiness</li> <li>• Loss of vision</li> <li>• Sees double or blurry</li> <li>• Stomachache/stomach pain/nausea</li> </ul> </div>	<div style="border: 1px solid black; padding: 5px;"> <ul style="list-style-type: none"> <li>• Poor coordination or balance</li> <li>• Blank stare/glassy eyed</li> <li>• Vomiting</li> <li>• Slurred speech</li> <li>• Slow to answer questions or follow directions</li> <li>• Easily distracted</li> <li>• Poor concentration</li> <li>• Strange or inappropriate emotions (ie. laughing, crying, getting mad easily)</li> <li>• Not performing as well</li> </ul> </div>

***What causes a concussion?***

Any blow to the head, face or neck, or a blow to the body which causes a sudden jarring of the head, may cause a concussion (for example, motor vehicle crash, hit on the head by an object, fall).

***What should you do if the individual gets a concussion?***

*The individual should stop activity right away.* He/she should not be left alone and should be seen by a doctor as soon as possible on that day. If a loss of consciousness (knock out) has occurred, call an ambulance to take him/her to a hospital immediately. Do not move the individual until the paramedics arrive.



### ***How long will it take to get better?***

The signs and symptoms of concussion (see above) often last for approximately 7-10 days, but may last much longer. In some cases, healing may take many weeks or months. Having had previous concussions may increase the time needed to heal.

### ***How is a concussion treated?***

*The most important treatment for a concussion is physical and mental rest.* The individual should not exercise, go to work or do any activities that may make him/her worse, like driving a car, reading or working on the computer. No snow shoveling, chopping wood, cutting the lawn, moving heavy objects, etc. If the individual goes back to activities before he/she is better, he/she is more likely to get worse, and to have symptoms longer. *Even though it is very hard for active individuals to rest, this is the most important step.* Once the individual is completely better at rest, he/she can start a step-wise increase in activities (see “**When can the individual return to work?**”). Being seen by a doctor before beginning the steps needed to return to activity is important to make sure he/she is completely better. In most cases a family doctor can make these decisions but in some cases a concussion expert may be required.

Returning to activities can be an individualized plan, but follows the same principles. Some examples of graded activities to get back to school, work and sport are:

- Increasing time out of the home;
- Increasing social interactions;
- Increasing time spent on the computer, using electronics or reading;
- Modifying hours at school, work or while playing sport; and
- Modifying school, work or athletic activities that place fewer demands (especially physical and cognitive) on the individual at first.

As a caregiver, if a child has sustained a concussion, there are return to school guidelines that can be followed, which are outlined below. For an adult or a child, if the injury occurred while participating in sport, there are specific return to play guidelines, also outlined below, which must be followed.

### ***Return to School Guidelines***

Sometimes children who have a concussion may find it hard to concentrate in school and may get a worse headache or feel sick to their stomach if they are in school. Children should stay home from school if their symptoms get worse while they are in class. Once they feel better, they can try going back to school at first for half days and if they are okay with that, then they can go back full time.



***Return to Sport Guidelines***

*It is very important that a concussed individual not go back to sports if he/she has any concussion symptoms or signs. Return to sport and physical activity must follow a step-wise approach:*

<b><i>Step</i></b>	<b><i>Type of Activity</i></b>	<b><i>Activity Description</i></b>	<b><i>Time Period</i></b>
<b>1</b>	No activity	Complete rest	<b>Must not</b> present any symptoms and <b>be cleared</b> by a doctor to proceed to <b>Step 2</b> .
<b>2</b>	Light exercises	Walking or stationary cycling. • <b>NO</b> resistance training.	Participate in activity for 10-15 minutes <b>without experiencing symptoms</b> .
<b>3</b>	Sport specific activity	<b>Progressive</b> addition of resistance training. • Activities such as skating in hockey, running in soccer.	Participate in activity for 20-30 minutes <b>without experiencing symptoms</b> .
<b>4</b>	“On field” practice	<b>No body contact</b> (e.g. no checking, no heading the ball) • <b>Progressive</b> addition of resistance training. • Activities such as ball drills, shooting drills.	
<b>5</b>	“On field” practice	Activities with body contact	<b>Must</b> be cleared by a doctor.
<b>6</b>	Regular game play		

***Note: Symptoms may get worse not just during activity, but later that day and the next. Each step must take a minimum of one day.*** If any symptoms of a concussion (e.g. headache, feeling sick to his/her stomach) return either during activity or later that day, all activity should be stopped immediately and the individual should rest for 24 hours. The concussed individual should be seen by a doctor and cleared again before starting the step wise protocol again.

***When should you see the doctor?***

Every person who gets a head injury should be seen by a doctor as soon as possible. You should take him/her back to the doctor IMMEDIATELY if, after being told the individual has a concussion, he/she has worsening of symptoms such as:

1. increased confusion

2. worsening headache
3. vomiting
4. not waking up
5. trouble walking
6. experiencing seizures
7. exhibiting strange behaviour

Problems caused by a concussion can get worse later that day or night. The individual should not be left alone and should be checked during the night. If you have any concerns about the person's breathing or how he/she is sleeping, wake him/her up. Otherwise, let him/her sleep. If he/she seems to be getting worse, you should see your doctor immediately. **No individual should go back to full activity until they have been cleared to do so by a doctor.**

Modified from the ThinkFirst-SportSmart Concussion Education and Awareness Program "Sport-Related Concussion: Guidelines for Parent" Handout - May, 2007.

Appendix 3: Bowen Therapy CRP Symptoms Scale Questionnaire

## Post Concussion Symptom Scale

Name: \_\_\_\_\_ Age/DOB: \_\_\_\_\_ Date of Injury: \_\_\_\_\_

**No symptoms "0"-----Moderate "3"-----Severe "6"**

### Time after Concussion

SYMPTOMS	Days/Hrs _____	Days/Hrs _____	Days/Hrs _____
Headache	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Nausea	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Vomiting	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Balance problems	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Dizziness	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Fatigue	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Trouble falling to sleep	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Excessive sleep	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Loss of sleep	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Drowsiness	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Light sensitivity	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Noise sensitivity	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Irritability	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Sadness	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Nervousness	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
More emotional	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Numbness	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Feeling "slow"	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Feeling "foggy"	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Difficulty concentrating	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Difficulty remembering	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Visual problems	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6

**TOTAL SCORE:**                    \_\_\_\_\_                    \_\_\_\_\_                    \_\_\_\_\_

Use of the Post-Concussion Symptom Scale: The athlete should fill out the form, on his or her own, in order to give a subjective value for each symptom. This form can be used with each encounter to track the athlete's progress towards the resolution of symptoms. Many athletes may have some of these reported symptoms at a baseline, such as concentration difficulties in the patient with attention-deficit disorder or sadness in an athlete with underlying depression, and must be taken into consideration when interpreting the score. Athletes do not have to be at a total score of zero to return to play if they already have had some symptoms prior to their concussion.



**Informed Consent/Assent for:  
Bowen Therapy for Concussion Resolution in Young Male Athletes:  
A Case-Series Research Proposal.**

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**Participants:** Please take time to read this document carefully and to discuss it with the researcher, your family, your doctor, or others before you decide to participate in this study. Your participation is completely **voluntary**. You have the right to refuse to participate in this study. If you decide to participate, you will be required to sign the consent (assent form with a legal guardian, if under 16 years old) at the end of this document. If you do decide to participate, you may still choose to withdraw from the study at any time without any negative consequences. Before you decide, it is important for you to understand what the research involves. This document will provide you with all the necessary information regarding why the research is being done, what will happen to you during the study and the possible benefits, risks and discomforts.

**Purpose of the research:** To document the efficacy and rate of recovery in young male athletes diagnosed with concussion, and investigate whether Bowen Therapy may reliably and consistently decrease recovery time needed to begin return to play (RTP) protocols along with the current standard treatment (rest and wait) for concussion injuries.

**Who can participate in this study?** You can participate in this study if you are a male athlete between the ages of 14-30 years of age, and have suffered a concussion from a sports-related injury. You must be able to speak and read English fluently.

**What does this research project involve?** Following a concussion injury, you will receive a SCAT 3 concussion assessment by a trained professional, followed by a Bowen Therapy treatment. The Bowen Therapist will interview you about your symptoms before treating you, and you will be required to fill in a questionnaire assessing your symptoms 24 hours, 48 hours and 72 hours after the Bowen Therapy treatment. One week later, you will be required to come back for a follow up SCAT 3 assessment, and receive another Bowen Therapy treatment if deemed necessary.

Bowen Therapy is a gentle, non-invasive form of bodywork. It works by relaxing and resetting the nervous system, muscles, and connective tissues. You will be fully clothed and lying comfortably on a massage table, whilst the Bowen Therapist applies gentle rolling moves over specific areas on your body, and then pauses intermittently for a few minutes in between sets of moves.

**Time required:** Participation will involve approximately 60-90 minutes for each Bowen Therapy session, scheduled 7 days apart.

**Risks:** There are no anticipated risks associated with participating in this study, however, individuals who have received temporomandibular condyle surgery or bite realignment by way of filing the teeth may experience a realignment of the TMJ in response to receiving Bowen Therapy TMJ procedure which may negate the effects of surgery (based on anecdotal evidence only, direct causal evidence is yet to be documented). Please indicate to your researcher if you have received this surgery, and if you do not wish to continue with Bowen Therapy treatment. Alternatively, you may choose to continue with Bowen Therapy without receiving the TMJ procedure, however, the desired effects may not be the same as the full treatment.

**What happens if something goes wrong during this study?** Signing this consent form in no way limits your legal rights against the researchers or anyone else. Any adverse event that should arise will be logged by the researchers and will be followed through to ensure your safety and well-being. The researchers of this study will be freely available if you would like to discuss any problems or concern that may arise.

**Can I be asked to leave the study?** In a rare event that a medical emergency occurs during this study period, you will be automatically withdrawn from the study to ensure your safety and well-being.

**Benefits:** There is no guarantee that you will experience any improvements in resolving your concussion symptoms as a result of receiving Bowen Therapy. Your participation will add to a growing body of knowledge of how the body responds to and heals from concussion, using Bowen Therapy as an intervention, along with resting and waiting. At the end of the study, the researchers will provide a thorough summary of the study's findings. If you wish to receive a copy of the case-series report, you can contact the researchers via email.

**Cost:** Each participant is required to contribute \$20, payable to Rejuvenation (Victoria) or Brynn Bicknell (Vancouver), which will be used to cover the administration costs of the study.

**Confidentiality:** Your participation in this study will remain confidential. There will be no link between your information, responses and your identity, which will be concealed. Your SCAT scores and survey responses will be assigned a code number, and the list connecting your name with this number will be kept in a locked cabinet

and will be destroyed once all the data have been collected and analyzed OR you may consent to have your information stored for future research. Information that contains your identity will remain only with the researcher. The list that matches your name to the unique study number that is used on your research-related information will not be removed or released without your consent unless required by law.

**Participation and withdrawal:** Your participation in this study is completely voluntary, and you may withdraw at any time without penalty. To withdraw, please inform the researcher that you no longer wish to participate (no questions will be asked). Your withdrawal from the study will not impact the final results.

**How to contact the researchers:** Please note that you may ask questions at any time. We will be glad to discuss your results with you when they have become available and we welcome your comments and suggestions. If you have any concerns about your rights as a research subject and/or your experiences while participating in this study, please contact Jenna Howe: [2rejenerate@gmail.com](mailto:2rejenerate@gmail.com), Ph:250-216-3353 in Victoria, B.C. or Brynn Bicknell [brynnbicknell@gmail.com](mailto:brynnbicknell@gmail.com) Ph: 778-977-4512 in Vancouver, B.C.

### **Consent Form for Participants:**

In signing this form you are consenting to participate in this research project.

I have received a satisfactory explanation of what the study entails, and I have read and I understand the purpose and procedures of this study as described in the participant information above, and I voluntarily agree to participate. I understand that at any time during the investigation I will be free to withdraw without any disadvantage. I will receive a signed and dated copy of all pages of the consent form and understand the contents of these pages, the proposed procedures and possible risks. I have had the opportunity to ask questions and have received satisfactory answers to all inquiries regarding this study. I understand that my name, initials or any protected health information such as my identification number, billing information, address, etc., will not be published and that my identity will remain anonymous and confidential. I understand that material collated from this study may be presented for publication and may be seen by the general public.

If any of the data collected (SCAT 3 scores, symptom checklist/survey and health intake) that I have provided for this research project is unused when the project is completed (Tick **one** choice from each of the following boxes)

- I wish my information sample to be destroyed immediately.
- I want my information to be destroyed after \_\_\_ years.
- I give permission for my information to be securely stored indefinitely.

**AND if the data is to be stored for future use:**

- I give permission for my information to be stored and used for future research projects on Bowen Therapy for Concussion Resolution.
- I give my permission for my information to be stored and used for future research of any type that has been properly approved of.
- I give permission for my information to be stored and used in future research, except for research about: \_\_\_\_\_

**AND**

- I want my identity to be removed from my data sample.
- I want my identity to be kept with my data sample.

I hereby give my consent for clinical information relating to my case to be submitted as part of a case-series report in the aforementioned study.

\_\_\_\_\_  
**Signature of Participant**                      **Printed name**                      **Date**

\_\_\_\_\_  
**Signature of Parent/Guardian**    **Printed name**                      **Date**

\_\_\_\_\_  
**Signature of Researcher**                      **Printed name**                      **Date**