

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

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Abstract

*Background:* Sports-related concussion in young and older athletes has recently become a 'hot' topic within sporting organizations and the media. Current treatment for concussion is: physical, mental and cognitive rest until symptoms resolve of their own accord. 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 diagnosed with concussion, and applied Bowen Therapy procedures [hereon known as the Concussion Resolution Protocol (CRP)] as a singular therapeutic intervention. Out of the 33 players treated, 90% of athletes were declared fit to return to play within 72 hours. All 33 players returned to play.

*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 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 and Brynn Bicknell in Vancouver. 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.

*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:

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<sup>®</sup>, 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 current 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 performed with the client typically 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. 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 volunteer adolescent athletes diagnosed with concussion, aged 15-29 (1 female, 32 male) and applied the Bowen Therapy Concussion Resolution Protocol (CRP) as a singular therapeutic intervention. Mattimoe's data showed that out of 33 players treated, 90% of athletes were declared fit to return to play within 72 hours. All 33 players returned to play. This study preceded the current 6-stage RTP protocols that are currently used by most athletic trainers and coaches.

Between 2003 and 2014 Jenna Howe 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. There is 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 (SCAT 3), and participants' self-reporting 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 SCAT 3, will conduct an evaluation on each participant following a suspected head injury. Voluntary participants will be referred to Jenna Howe for Bowen Therapy CRP ([www.concussionresolution.com](http://www.concussionresolution.com)) or to Brynn Bicknell. 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 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, BC area. 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 (Appendix 3) 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 questionnaire (Appendix 4) in which they rate and record their subjective symptoms pre-CRP and post-CRP 24, 48 & 72 hours later.

*Participant confidentiality:* Participants' names and data will be coded to protect each person's health data, and no personal information identifying participant will be made public. Consent will be obtained by each participant voluntarily signing a formal consent form (Appendix 5) outlining 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 be evaluated with the

SCAT 3 tool, but have previously had mandibular condyle surgery will be offered Bowen Therapy CRP without the TMJ moves, and asked to fill in the subjective symptoms questionnaire 24, 48 & 72 hours after being diagnosed with concussion, 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 the 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, 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 be 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 (McCrorry 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. Participants will complete a symptom checklist (scaled from 1-10) questionnaire outlining time periods when at home between sessions. Each 'patient' will be given the exact same test and symptom scale, pre- and post- Bowen Therapy CRP sessions. In an effort to minimise research bias, the athletic trainer, not trained in Bowen Therapy, will conduct the concussion symptom assessments. To maintain consistency, the same Bowen Therapy practitioners will apply the CRP in both sessions.

*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, as non-experimental studies do not attempt to provide comparative data for statistical analysis. They serve as pioneering endeavours, even as low-level research evidence, 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 or significantly diminished side-effects from concussion injuries, have been recorded by various Bowen Therapy practitioners around the world. The principal investigators of this study intend to conduct a more formal and clearly documented 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. Having an independent, non-Bowen Therapy athletic trainer doing the SCAT 3 assessments and RTP protocols, attempts to limit research bias.

### 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 concussions 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
- Appendix 2: Concussion Guideline handout
- Appendix 3: SCAT 3 Assessment
- Appendix 4: Bowen Therapy CRP Symptoms Questionnaire
- Appendix 5: Participant Consent Form