

# An Effective Patient-Centered Approach to Chronic Pain: A Case Report

Michael Y Guo<sup>1</sup>, Agnes Stogicza<sup>2</sup>, Brenda Lau<sup>1,3</sup>, Lindsay Rite<sup>1,3</sup>, Malcon C Botteon<sup>3,4</sup>

Citation: UBCMJ. 2019; 11.1 (30-32)

## Abstract

**Background:** Chronic pain is a highly prevalent chronic condition in Canadians, which is arduous to treat and leads to a multitude of chronic comorbidities if treated sub-optimally. We aim to provide an example of evidence-based interdisciplinary care in a community-based clinic for a 28-year-old female with nine-year history of chronic neck and back pain whose symptoms were not controlled by multiple prior treatment modalities.

**Case:** The patient developed constant neck and back pain with debilitating headaches and a mood disorder after a motor vehicle accident. Treatment over 12 months included a wide variety of medical interventions, manual therapies, and counselling, with emergency room visits for managing pain flare-ups. The patient underwent myofascial trigger point injections targeting previously identified myofascial pain, then diagnostic ultrasound-guided medial branch blocks to assess facet joint involvement, followed by prolotherapy while awaiting referral to radiofrequency ablation of affected sites. Simultaneously, she joined in-clinic group education programs led by multiple health practitioners aimed at self-management of symptoms, including headache management, sleep improvement, behavioural modifications to cope with psychological responses to pain, diet planning, and functional movement rehabilitation.

**Results:** The patient noted progressive improvement within 12 months after her initial visit, with substantial self-reported improvements in pain severity and interference, ability and confidence in coping with pain, and depressive symptoms.

**Conclusions:** This case report documents a successfully managed case of chronic neck and back pain by combining multiple procedures with patient education and behavioural change programs that address other crucial components of pain control such as sleep, nutrition, and retraining movement.

## Background

The prevalence of chronic pain in Canada is estimated to be 16-29%, with back or neck pain alone constituting more than 10% of all visits to primary care physicians.<sup>1,2</sup> The complexities of chronic pain are compounded by comorbidities such as anxiety, depression, and decreased mental, physical, and social functioning.<sup>3-5</sup> The interplay of physiological, emotional, cognitive, and social elements of this disease highlights the need for a multidimensional approach for management, now dubbed the “biopsychosocial approach.”

Many current healthcare services are oriented towards acute care and reducing mortality risk rather than morbidity, leading to under-recognition and inadequate service for such chronic conditions.<sup>6</sup> Hence, a fundamental change in the way our services are delivered is needed to approach long-term, multifaceted illnesses like chronic pain. Interdisciplinary pain centres are the focus of this evidence-based care model.<sup>7</sup> At interdisciplinary clinics, treatment is based on goals for therapy and the proposed mechanism of the pain, supplemented with a variety of supportive strategies offered in-clinic. Such an example is the CHANGEpain clinic (CPC), located in Vancouver, BC, which is comprised of a team of pain specialists, general practitioners, and allied health professionals, and serves patients with a wide spectrum of pain disorders and socioeconomic circumstances.<sup>8</sup>

The CPC treats chronic pain with a layered approach: first targeting myofascial dysfunction with local saline injections, followed by imaging-guided local nerve blocks to identify affected nerves, then with longer-acting techniques to alter pain stimulation such as radiofrequency lesioning (RFL) or augmentation with prolotherapy. A

core component of the CPC's care plan introduces interactive pain neuroscience educational group workshops for all patients to learn self-management strategies, which include movement and exercise programs, relaxation techniques, sleep improvement, nutrition assessment, headache management, and behavioural approaches to cope with pain. Patients may choose to receive weekly 30-60-minute sessions, spanning 2-5 weeks, on the aforementioned topics led by a team of psychiatrists, certified pain management specialists, integrative medicine specialists, and yoga instructors. Each patient also receives a comprehensive list of free community resources for self-management of pain. The workshops are guided by growing evidence on the value of psychological services and self-management at an early presentation for chronic pain.<sup>9-11</sup> Education and self-management are cornerstones of the multidisciplinary care model, which enable behavioural interventions.<sup>12,13</sup> Behavioural strategies such as cognitive behavioural therapy and mindfulness meditation have shown significant benefit for pain outcomes, quality of life, and productivity, particularly in those with comorbid mental health conditions.<sup>12-15</sup> Functional movement rehabilitation services such as physiotherapy, chiropractic, kinesiology, yoga, and exercise physiology are a core component that enhances the sustained effectiveness of the medical services provided by the pain specialists.

With this case study, we aim to illustrate the clinical course of a chronic pain patient receiving treatment at a community-based interdisciplinary pain clinic to give healthcare practitioners insight into an interdisciplinary, mechanism-based care model for people suffering from chronic pain.

## Case

A 28-year-old woman was referred to CPC with a nine-year history of a persistent headache and constant, aching pain spanning her neck

<sup>1</sup>Faculty of Medicine, University of British Columbia, Vancouver, Canada

<sup>2</sup>Faculty of Medicine, University of Washington, Seattle, Washington, United States

<sup>3</sup>CHANGEpain clinic, Vancouver, Canada

<sup>4</sup>University of Sao Paulo, Brazil

Correspondence to:  
Michael Y Guo (michael.guo@alumni.ubc.ca)

and upper back after a motor vehicle accident in July 2008. Immediately following the motor vehicle accident, computerized tomography imaging of the head and neck revealed no structural damage. She continued to experience headaches, pain in the neck and upper back, as well as depression, which interfered with regular activity such that she could no longer complete her university degree. Since the accident, she has received the following therapies: physiotherapy, kinesiology, massage therapy, cognitive behavioural therapy, group therapy, intramuscular stimulation, and multiple pain medications, including prescribed opioids. She visited the emergency room for pain flare-ups. She was diagnosed with myofascial pain, post-concussion syndrome, major depressive disorder, and post-traumatic stress disorder during this time.

At her initial visit to CPC in 2017, she characterized her pain as a constant dull ache in both sides of her neck rated as 7/10 on the numeric pain scale (NPS), upper back (8/10 NPS), and right lower back (4/10 NPS) with intermittent sharp pains worsened by prolonged postures and activity. She also experienced constant, nausea-inducing headaches bilaterally from her forehead to the occipital region. Physical exam revealed a forward-stooped posture and painful areas spanning diffusely from her left temporalis, spanning down along her vertebrae and paraspinal muscles to both iliotibial bands and right hamstring muscles. Active range of motion was limited for all cervical spine movements and extension of the lumbar spine. Neurological exam was normal.

Assessment of clinical findings suggested widespread myofascial pain and cervicogenic headache secondary to referred pain from cervical and thoracic spine structures. Her goal of therapy was to reduce pain and fatigue to a level where she could work from her office and attend social outings.

Immediate recommendations were to begin a series of myofascial trigger point injections (TPI) and enrolment into in-clinic group education programs and interactive workshops aimed at self-management of headaches and the behavioural response to pain, diet planning, and sleep improvement through pain neuroscience knowledge. She received five sessions of TPI that were spaced two weeks apart and done to assess the extent of myofascial dysfunction contributing to pain. When reassessed three months later, she reported increased range of motion and decreased headache.

As the initial therapies provided short relief lasting several hours to days of her back pain, she underwent four sessions of ultrasound-guided diagnostic and therapeutic medial branch blocks with a long-acting local anesthetic (ropivacaine) targeting spinal segments T8-11. She reported 90-100% pain relief in between the treatments, scheduled two weeks apart. She noted improved mood, increased activity levels, and discontinued all pain medications. Areas consistently providing the most pain relief were at T9-10, which prompted a referral for RFL, which involves insertion of an electrode that generates heat-emitting radio waves to create a lesion along a nerve that is causing pain of the affected area. While awaiting her appointment for RFL, which was only available at the hospital under fluoroscopy guidance, she was offered prolotherapy as an alternate therapy. Prolotherapy is a “regenerative” injection therapy purported to address chronic musculoskeletal pain through a mechanism involving treatment of ligamentous laxity and direct effects on nerve tissue.<sup>16</sup>

She elected to undergo four sessions of prolotherapy (1 mL glycerin 25%/dextrose 25%/phenol 2.34%, 3 mL lidocaine 1%, 2

mL 50% dextrose). These injections were spaced one month apart and targeted the bilateral levator scapulae and rhomboid attachments, spinous processes and laminae of C2-L1, bilateral facet joints of C3-T10, and the occiput/nuchal ridge. The cervical facets and laminae were injected under ultrasound guidance, while the other targets were injected with landmark guidance. Concurrently with the prolotherapy, she also received in-clinic strength and conditioning coaching from an exercise physiologist. She received a nutritional assessment performed by an integrative medicine specialist (MD with specialized training), a group therapy session led by a psychiatrist, two seminars on the causes and management of headaches, five sessions on pain management strategies, five sessions on improving sleep, and regular in-house Pilates classes. During her course of therapy at CPC, she saw a team of anesthesiologists, a rheumatologist, a physiatrist, specialized family physicians, a registered holistic nutritionist, a chiropractor with exercise physiology training, and Pilates instructors.

Twelve months after her initial consultation, she completed a comprehensive list of validated questionnaires that were compared to her baseline scores. Her results indicated substantial improvements in pain severity and interference, ability and confidence in coping with pain, and depressive symptoms (Table 1).

**Table 1 |** Scores for outcome questionnaires comparing the initial presentation and condition at 12 months.

<sup>a</sup>Brief Pain Inventory (Short Form): Higher scores represent greater interference of life activities.  
<sup>b</sup>Patient Health Questionnaire: 14-20 = moderately severe depression, 5-9 = mild depression.  
<sup>c</sup>Pain-related Self Statements Scale: CAT: <2.73 shows lower tendency to catastrophize; ACT: <2.73 shows lower tendency to use active coping strategies.  
<sup>d</sup>Patient Self Efficacy Questionnaire: <25 relates to low confidence in managing pain and low function; >40 shows higher confidence in managing pain and increased function.

	BPI <sup>a</sup>		PHQ-9 <sup>b</sup>	PRSS <sup>c</sup>		PSEQ <sup>d</sup>
	Pain Interference	Pain Severity		CAT	ACT	
1 <sup>st</sup> Visit	43/70	5/10	15/27	2.7/5	2.4/5	26/60
12 months	27/70	2.5/10	6/27	1.3/5	2.7/5	42/60

**Discussion**

This case of a recovering patient with chronic neck and back pain, as indicated by validated questionnaires for pain intensity and interference, depression, and coping capabilities, introduces the utility of a mechanism-based interdisciplinary model of care. Based on self-reported outcomes after 12 months of treatment, the patient experienced decreased pain severity and interference (Brief Pain Inventory),<sup>17</sup> increased functioning and confidence in pain management (Patient Self Efficacy Questionnaire),<sup>18</sup> and fewer depressive mood symptoms (Patient Health Questionnaire).<sup>19</sup>

Multi-disciplinary care is supported by high quality evidence as the standard for managing chronic pain,<sup>7</sup> and has shown significant improvements in many aspects of pain care, including improved pain outcomes, reduced wait times, work absence, and long-term disability, and favorable cost-benefit estimates.<sup>7,20-24</sup> However, multidisciplinary rehabilitation is difficult to study due to a wide range of healing philosophies, intervention components, and expertise of practitioners. There is a paucity of evidence on optimal content or timing of therapies,<sup>25</sup> and the implementation of multi-disciplinary care is constrained by resource and structural limitations involving such an array of healthcare practitioners. Here we provide an example of an effective multi-disciplinary care model delivered by the CPC. Due to the complexity of this approach, no single treatment can be highlighted as

more efficacious than the others. The patient felt that her commitment to active rehabilitation was a critical element of her engagement in the recovery program. A core aspect of this approach lies in the open and frequent communication between separate practitioners, and the integration of each opinion and plan into a common shared clinical record readily accessed by all team members. This is different than many multi-disciplinary approaches, where separate therapists operate in silos without an understanding of therapeutic responses seen by other practitioners.

Following the trajectory of this case, myofascial releasing needle treatments were provided first to address potential dysfunctional muscle, fascia, and biomechanics,<sup>26</sup> as indicated by the patient's prior diagnosis of myofascial pain. Partial responsiveness to the first layer of treatment warranted the examination and diagnostic testing of deeper structures such as the cervical and thoracic facet joints. Diagnosis of facet joint pathology cannot be made accurately with physical exam,<sup>27</sup> nor imaging.<sup>28</sup> However, there is strong evidence for the diagnostic value of nerve blocks providing at least 75% pain relief and restoration of activities.<sup>29</sup> Accurate testing requires ultrasound or fluoroscopy-guided nerve blocks using long-acting local anesthetic. Positive findings on diagnostic nerve blocks naturally progress to longer-term solutions like RFL, which have proven efficacy for pain control in patients refractory to other treatments.<sup>30,31</sup> In this case, prolotherapy was recommended to address the pain trigger of ligament laxity.<sup>32-35</sup> In patients responsive to prolotherapy, RFL provides longer term symptomatic relief as the root cause is addressed for the ongoing myofascial pain.

In summary, this case illustrates the complexity of chronic pain treatment, which requires a multi-faceted approach. To be effective long-term, pain procedures or physical therapies should be augmented with changes in behaviour, perception and movement patterns. Evidence-based pain neuroscience education equips a patient with the skills to adapt to common comorbid conditions that affect pain control, such as sleep improvement, nutrition assessment, and behaviour management.

## References

- Schopflocher D, Taenzer P, Jovey R. The prevalence of chronic pain in Canada. *Pain Res Manag*. 2011 Dec;16(6):445-50.
- Mafi JN, McCarthy EP, Davis RB, Landon BE. Worsening Trends in the Management and Treatment of Back Pain. *JAMA Intern Med*. 2013 Sep 23;173(17):1573.
- Breivik H, Collett B, Ventafridda V, Cohen R, Gallacher D. Survey of chronic pain in Europe: prevalence, impact on daily life, and treatment. *Eur J Pain*. 2006 May;10(4):287-333.
- Goesling J, Clauw D, Hassett A. Pain and depression: an integrative review of neurobiological and psychological factors. *Curr Psychiatry Rep*. 2013;15(12):421.
- Moulin DE, Clark AJ, Speechley M, Morley-Foster PK. Chronic pain in Canada—prevalence, treatment, impact and the role of opioid analgesia. *Pain Res Manag*. 2002;7(4):179-84.
- Turk D, Wilson H, Cahana A. Treatment of chronic non-cancer pain. *Lancet*. 2011 Jun 25;377(9784):2226-35.
- Kamper SJ, Apeldoorn AT, Chiarotto A, Smeets RJE, Ostelo RWJG, Guzman J, et al. Multidisciplinary biopsychosocial rehabilitation for chronic low back pain: Cochrane systematic review and meta-analysis. *BMJ*. 2015 Feb 18;350:h444.
- May C, Breic V, Lau B. Characteristics and complexity of chronic pain patients referred to a community-based multidisciplinary chronic pain clinic. *Can J Pain*. 2018 Mar;2(1):125-34.
- Shipton E. The transition of acute postoperative pain to chronic pain: Part 2 — Limiting the transition. *Trends Anaesth Crit Care*. 2014;4(2-3):71-5.
- Oliveira VC, Ferreira PH, Maher CG, Pinto RZ, Refshauge KM, Ferreira ML. Effectiveness of self-management of low back pain: systematic review with meta-analysis. *Arthritis Care Res*. 2012 Nov;64(11):1739-48.
- Yu H, Côté P, Southerst D, Wong JJ, Varatharajan S, Shearer HM, et al. Does structured patient education improve the recovery and clinical outcomes of patients with neck pain? A systematic review from the Ontario Protocol for Traffic Injury Management (OPTIMA) Collaboration. *Spine J*. 2016 Dec;16(12):1524-40.
- Monticone M, Ambrosini E, Cedraschi C, Rocca B, Florentini R, Restelli M, et al. Cognitive-behavioral treatment for subacute and chronic neck pain: A Cochrane Review. *Spine Phila Pa 1976*. 2015 Oct 1;40(19):1495-504.
- McCracken L, Turk D. Behavioral and cognitive-behavioral treatment for chronic pain: outcome, predictors of outcome, and treatment process. *Spine*. 2002 Nov 15;27(22):2564-73.
- Hilton L, Hempel S, Ewing B, Apyadin E, Xenakis L, Newberry S, et al. Mindfulness meditation for chronic pain: systematic review and meta-analysis. *Ann Behav Med*. 2017;51(2):199-213.
- Crofford LJ. Psychological aspects of chronic musculoskeletal pain. *Best Pract Res Clin Rheumatol*. 2015 Feb;29(1):147-55.
- Linetsky F, Botwin K, Gorfine L, Jay GW, McComb B, et al. Regeneration injection therapy (RIT): Effectiveness and appropriate usage [Internet]. The Florida Academy of Pain Medicine; 2001 [cited 2019 Feb 10]. Available from: [http://www.gracemedicalgroup.com/resources/articles/rt\\_file\\_0025.pdf](http://www.gracemedicalgroup.com/resources/articles/rt_file_0025.pdf)
- Tan G, Jensen M, Thornby J, Shanti B. Validation of the brief pain inventory for chronic nonmalignant pain. *J Pain*. 2004 Mar;5(2):133-7.
- Flor H, Behle D, Birbaumer N. Assessment of pain-related cognitions in chronic pain patients. *Behav Res Ther*. 1993 Jan;31(1):63-73.
- Bhana A, Rathod S, Selohilwe O, Kathree T, Petersen I. The validity of the Patient Health Questionnaire for screening depression in chronic care patients in primary health care in South Africa. *BMC Psychiatry*. 2015 May 23;15:118.
- Speerin R, Slater H, Li L, Moore K, Chan M, Dreinhöfer K, et al. Moving from evidence to practice: Models of care for the prevention and management of musculoskeletal conditions. *Best Pract Res Clin Rheumatol*. 2014 Jun;28(3):479-515.
- Dobscha S, Corson K, Perrin NA, Hanson GC, Leibowitz RQ, Doak MN, et al. Collaborative care for chronic pain in primary care: a cluster randomized trial. *JAMA*. 2009 Mar 25;301(12):1242-52.
- Kroenke K, Krebs E, Yu Z, Chumbler N, Blair M. Telecare collaborative management of chronic pain in primary care: a randomized clinical trial. *JAMA*. 2014 Jul 16;312(3):240-8.
- Scascighini L, Toma V, Dober-Spielmann S, Sprott H. Multidisciplinary treatment for chronic pain: a systematic review of interventions and outcomes. *Rheumatol Oxf*. 2008 May;47(5):670-8.
- Cunningham J, Rome J, Kerkvliet J, Townsend C. Reduction in medication costs for patients with chronic nonmalignant pain completing a pain rehabilitation program: a prospective analysis of admission, discharge, and 6-month follow-up medication costs. *Pain Med*. 2009;10:787-96.
- Watershoot F, Dijkstra P, Hollak N, de Vries H, Geertzen J, Reneman M. Dose or content? Effectiveness of pain rehabilitation programs for patients with chronic low back pain: a systematic review. *Pain*. 2014;155:179-89.
- Liu L, Huang Q, Liu Q, Ye G, Bo CZ, Chen MJ, et al. Effectiveness of dry needling for myofascial trigger points associated with neck and shoulder pain: a systematic review and meta-analysis. *Arch Phys Med Rehabil*. 2015 May;96(5):944-55.
- King W, Lau P, Lees R, Bogduk N. The validity of manual examination in assessing patients with neck pain. *Spine J*. 2007;7:22-6.
- Nordin M, Carragee E, Hogg-Johnson S, Weiner SS, Hurwitz EL, Peloso PM, et al. Assessment of neck pain and its associated disorders: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. *J Manip Physiol Ther*. 2009;32:S117-40.
- Falco F, Datta S, Manchikanti L, Sehgal N, Geffert S, Singh V, et al. An updated review of the diagnostic utility of cervical facet joint injections. *Pain Physician*. 2012;15:E807-38.
- Van Zundert J, Vanelderden P, Kessels A, van Kleef M. Radiofrequency treatment of facet-related pain: evidence and controversies. *Curr Pain Headache Rep*. 2012 Feb;16(1):19-25.
- Leggett R, Soril L, Lorenzetti D. Radiofrequency ablation for chronic low back pain: a systematic review of randomized controlled trials. *Pain Res Manag*. 2014 Oct;19(5):e146-53.
- Hung C, Hsiao M, Chang K, Han D, Wang T. Comparative effectiveness of dextrose prolotherapy versus control injections and exercise in the management of osteoarthritis pain: a systematic review and meta-analysis. *J Pain Res*. 2016;9:847-57.
- Sit R, Chung V, Reeves K. Hypertonic dextrose injections (prolotherapy) in the treatment of symptomatic knee osteoarthritis: a systematic review and meta-analysis. *Sci Rep*. 2016;6:25247.
- Morath O, Kubosch E, Taeymans J, Zwingmann J, Konstantinidis L, Sudkamp NP, et al. The effect of sclerotherapy and prolotherapy on chronic painful Achilles tendinopathy—a systematic review including meta-analysis. *Scand J Med Sci Sports*. 2018 Jan;28(1):4-15.
- Hauser R, Lackner J, Steilen-Matias D, Harris D. Systematic review of dextrose prolotherapy for chronic musculoskeletal pain. *Clin Med Insights Arthritis Musculoskelet Disord*. 2016 Jul 7;9:139-59.