Evaluation of a pharmacist-led interprofessional chronic pain clinic in Canada

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ABSTRACT

Background: Chronic noncancer pain (CNCP) is a common condition that affects individuals at a biopsychosocial level and can significantly impair function and quality of life. Referral to an interprofessional CNCP program is recommended for most patients; however, these clinics are limited in number and capacity. Expanding access by testing new service delivery models would be of value. The purpose of this study was to measure the impact of a new pharmacist-led, interprofessional model of care developed at the University of Saskatchewan Chronic Pain Clinic.

Methods: A retrospective chart audit was conducted using data that included adult patients referred for CNCP management between May 2020 and December 2021. Medication use, overall health status (using the Clinical Global Impression of Change–Improvement [CGI-I] scale) and patient readiness to change (using the Transtheoretical Model) were measured 6 months after the initial appointment.

Results: The study included 138 patients. Of the 80 patients taking an opioid, 22.5% were switched to buprenorphine/naloxone and the remainder had their mean morphine-equivalent dose reduced by a mean of 41.7 mg/d. Overall patient health status was minimally improved and many patients moved into the Action stage of change.

Discussion: Changes in opioid use demonstrate a clinically important shift toward safer medication regimens that are less likely to lead to toxicity and unintended overdose. CGI-I data suggest that these patients, whose health status is typically very difficult to change, did not deteriorate but slightly improved after attending the clinic.

Conclusion: The unique pharmacist-led, interprofessional model of care used by the University of Saskatchewan Chronic Pain Clinic may offer a viable alternative to traditional physician-led models. *Can Pharm J (Ott)* 2023:156:265-271.

Pharmacists are consulted regularly to taper patients' opioids but, in many regions, have no chronic pain clinic available to help. We tested a pharmacist-led model of an interprofessional chronic pain clinic that uses the resources available in smaller provinces rather than hoping for chronic pain physicians to be recruited.

Les pharmaciens sont régulièrement consultés pour réduire les opioïdes des patients, mais dans de nombreuses régions, il n'y a pas de centre de gestion de la douleur chronique pour les aider. Nous avons décidé d'évaluer un modèle de clinique interprofessionnelle de gestion de la douleur chronique, dirigé par des pharmaciens, qui utilise les ressources disponibles dans les petites provinces, plutôt que d'espérer que des médecins spécialistes de la douleur chronique soient recrutés.

Background

The World Health Organization recently officially recognized chronic pain as disease, resulting in a revision to the International Classification of Diseases (ICD-11) and validating the experiences of millions of people around the world who live with this disease.[1] Chronic pain is a complex condition that often results in comorbid emotional distress, mental illness and functional disability. Poorly managed chronic pain affects all aspects of an individual's life, often making the simplest tasks difficult.

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KNOWLEDGE INTO PRACTICE

- It is estimated that 1 in 5 Canadians experiences chronic pain.
- Management of chronic pain is challenging due to the complex approach to treatment and the large numbers of people affected.
- Interdisciplinary chronic pain clinics, the gold standard of care, are extremely difficult to access.
- This study provides evidence that the novel pharmacist-led, interprofessional model used at the University of Saskatchewan Chronic Pain Clinic may be a viable alternative to the physician-led models commonly used.
- Future research should continue to evaluate this model of chronic pain care.

MISE EN PRATIQUE DES CONNAISSANCES

- On estime qu'un Canadien sur cinq souffre de douleurs chroniques.
- La gestion de la douleur chronique est un défi en raison de l'approche complexe du traitement et du grand nombre de personnes touchées.
- Les cliniques interdisciplinaires de gestion de la douleur chronique, qui constituent la norme d'excellence en soins, sont extrêmement difficiles d'accès.
- Cette étude prouve que le modèle interprofessionnel, dirigé par un pharmacien, utilisé à la clinique de gestion de la douleur chronique de l'Université de la Saskatchewan peut être une alternative viable aux modèles couramment utilisés et dirigés par un médecin.
- Les recherches futures devraient continuer à évaluer ce modèle de soins de la douleur chronique.

Management of chronic pain is a challenge for health systems due to the complex approach to treatment, the large numbers of people affected and the lack of a formalized system of care in some regions.[2] It is estimated that 1 in 5 Canadians experiences chronic pain.[1] The treatment of chronic pain is further complicated by the opioid crisis and the increased awareness of avoiding unnecessary opioid use. Chronic pain guidelines recommend opioid minimization to optimize patient outcomes and improve safety but provide no specific recommendations on how to do this in people already taking high doses of opioids chronically.[3] It has been well established that interdisciplinary chronic pain clinics (ICPCs), which offer integrated services that combine mind, movement and medication treatment strategies, are the gold standard of care because they are both economically and clinically effective.[1,3] Unfortunately, waitlists to access ICPCs are exceptionally long, and in many areas these clinics do not exist.[2] A recent study found that 9 of 10 Canadian provinces have at least 1 ICPC, but most had only 1 clinic per 300,000 people, the majority of whom were located in large urban centres.[2]

There are many documented barriers to increasing access to ICPCs, the greatest and most obvious being the significant expense required to operate these clinics.[1,3] Additionally, there is a well-documented lack of medical professionals, particularly physicians, who have the specialized training, expertise and willingness to practice in chronic pain.[1] Access to these specialized medical services is more difficult in countries like Canada that have large proportions of the population living in rural and remote locations.[1]

In 2020, the University of Saskatchewan Chronic Pain Clinic (UCPC) was launched using a unique model of care that aimed to improve access to ICPCs.[4] The goal of the UCPC is to provide interdisciplinary, evidence-based, time-limited chronic pain care using a pharmacist-led model with less reliance on the physician role. The team has grown to include a full complement of medication-, mind- and movement-focused clinicians and consists of 2.2 full-time equivalent (FTE) pharmacists, 2.1 FTE social workers, 2.0 FTE physiotherapists and a 0.4 FTE family physician with decades of experience practising within a subspecialty of chronic pain. The clinic is in Saskatoon and offers in-person appointments Monday to Friday. A virtual service, which was used exclusively during the COVID-19 pandemic, is also offered and allows for any resident of Saskatchewan to participate. Referrals are accepted from any health professional or directly from patients.

Referral forms are prescreened by the UCPC physician to ensure appropriateness and completeness. All new patients have an initial 30-minute group appointment with a pharmacist and the physician to explain the clinic's services, determine the patient's goals, collect a medication history, clarify the diagnosis, characterize the nature of the chronic pain and ensure that the patient is interested in continuing in the program. Based on this initial appointment, an individualized care plan for each patient is developed that typically includes multiple appointments with the pharmacist, physiotherapist and social worker (either as individual or group appointments). The team uses a combination of mind, movement and medication strategies to help patients achieve their individualized goals.

The UCPC pharmacist guides the patient through their experience and takes responsibility for communicating with the patient's primary care provider. The UCPC physician rarely sees patients after the initial appointment but is available as a resource to the team to discuss individual patients and offer mentorship. The clinic does not prescribe, but the UCPC pharmacist works closely with the referring provider to adjust pain medications, when necessary. If opioid tapering is part of the care plan, it is closely supported by the UCPC team and is done

in a slow, patient-centred manner, and psychological supports are provided to minimize potential harms associated with tapering patients off long-term opioid therapy.[5,6] Take-home naloxone kits are offered to any patients who do not already have one. The UCPC also has a psychiatrist and dietitian who accept referrals from the team in an expedited time frame at no cost to patients.

The UCPC provides a variety of patient group education and support sessions on a regular basis, which are delivered virtually and offered to all patients immediately upon referral while they wait for their initial appointment. Additionally, the UCPC offers a referring health provider mentorship program. After referring a patient, health providers (typically family physicians) are offered one-on-one discussion(s) with the UCPC pharmacist and physician, who provide patient-specific mentorship and education on chronic pain management and/or opioid prescribing. The UCPC aims to create and implement an individualized care plan for each patient with the goal of discharging them back into the care of their primary care provider approximately 6 months after their initial appointment. Patients are encouraged to continue participating in the group education and support sessions indefinitely if they are interested.

The purpose of this study was to describe the patients who were referred to the UCPC and to measure the impact that the clinic had on the safety of pain medication regimens and on overall patient health status.

Methods

This study was a retrospective chart audit using data that were entered into the UCPC electronic medical record (EMR) as part of normal patient care. The primary outcomes were changes in mean morphine equivalent (MME) doses and the proportion of patients who were switched from a traditional opioid to buprenorphine/naloxone for their chronic pain. Any patient 18 years or older who was referred to the UCPC and who attended an initial appointment between May 2020 and December 2021 was included. A research assistant extracted the data from the charts approximately 6 months after each patient attended their initial appointment. Medication use was measured by comparing baseline medication lists, compiled by the pharmacist during the initial patient appointment, with the lists documented approximately 6 months later. MME doses per day were calculated for all patients taking opioids, and the baseline MME was compared with the MME 6 months later. When MME was calculated, patients who were taking methadone, buprenorphine or any intrathecally administered opioid were not included because reliable MME conversions are not known. The Clinician Global Impression–Improvement (CGI-I) scale, which is a 7-point health provider–assessed measure of the extent to which an individual patient's overall health status has improved, was administered at most follow-up visits. The CGI-I score documented approximately 6 months after the initial appointment was extracted as a measure of the change in each patient's overall health status. Patient readiness to change (using the Transtheoretical Model) was also assessed as part of typical patient care, and the patient's stage of change at baseline was compared with the stage approximately 6 months after the initial appointment. The differences between baseline and 6-month MME doses were compared using a paired-samples *t*-test, and remaining data were analyzed using descriptive statistics. Data analyses were completed using IBM SPSS Statistics software (version 25.0, IBM Corp, Armonk, NY). The research protocol was approved by the University of Saskatchewan Research Ethics Board.

Results

A total of 138 patients were included in the study. The mean age was 55.5 years, 71% were female, 60.9% were referred by a physician and each patient attended a mean of 6.5 appointments (range 1-30) at the UCPC (Table 1). The average follow-up period was 102.9 days. Patients had on average 5.5 comorbid medical conditions, including 46% who had a pre-existing mental health diagnosis. Pain severity scores measured at or prior to the initial appointment describe a cohort of patients with moderate-severe chronic pain (Table 1).

Of the patients who were taking an opioid at baseline (not including buprenorphine, methadone or intrathecal opioids), 22.5% (n = 18/80) were successfully switched to buprenorphine/naloxone (Suboxone) to treat their chronic pain (i.e., not for primary treatment of opioid use disorder). In 15 of the 18 cases, the conversion was completed using a low-dose buprenorphine/naloxone (microdosing) initiation regimen. Change in MME dose was calculated for 60 of the 138 patients included in the study. Patients were not included in this MME dose change analysis if they were not taking opioids at baseline (n = 43), if they were taking buprenorphine, methadone or intrathecal opioids at baseline (n = 15) and if their baseline opioid was switched to methadone (n = 2) or buprenorphine/naloxone by the UCPC team (n = 18). Baseline MME dose was reduced by a mean of 41.7 mg, from 230.7 mg/d to 189.0 mg/d (p = 0.011). Minimal changes were made to the use of the nonopioid adjunctive pain medications that were reported at baseline, aside from changes to gabapentinoid therapy in 32 patients (Table 2). Minimal changes were also made to the use of the high-risk medications that were reported at baseline, aside from changes to gabapentinoid and benzodiazepine therapies, which included 7 patients who were taken completely off their benzodiazepine (Table 3).

The CGI-I scale was assessed by one of the UCPC team members, as part of usual care at the most recent follow-up appointment, in 45.7% (n = 63/138) of participants. The mean CGI-I score at the most recent follow-up was 3.1, which correlates with "minimal improvement" in the overall health status of these 63 patients. The patients' self-reported stage of change (using the Transtheoretical Model), related to their willingness to make the changes required to achieve their individualized

TABLE 1 Baseline participant information ($n = 138$)

Female sex, %	71.0
Mean age, y	55.5
Mean number of nonpain comorbidities	5.5
Common nonpain comorbidities, *n* (%)*	
Depression	33 (23.9)
Cardiovascular disease	33 (23.9)
Anxiety	28 (20.3)
Sleep disorder	27(19.6)
Diabetes	16 (11.6)
Bipolar disorder	6 (4.3)
Posttraumatic stress disorder	3 (2.2)
Obesity	2 (1.4)
Primary pain conditions, *n* (%)	
Osteoarthritis	36 (26.1)
Headaches	27 (19.6)
Fibromyalgia	24 (17.4)
Back pain	23 (16.7)
Hernia	9 (6.5)
Shoulder pain	7 (5.1)
Scoliosis	7 (5.1)
Other	5 (3.6)
Opioids used, *n* (%)†	
Hydromorphone	42 (30.4)
Oxycodone	14 (10.1)
Transdermal fentanyl	13 (9.4)
Morphine	13 (9.4)
Codeine	13 (9.4)
Buprenorphine	7 (5.1)
Intrathecal opioid	5 (3.6)
Methadone	5 (3.6)
Tramadol	5 (3.6)
Nonopioid pain medications used, *n* (%)*	
Gabapentin/pregabalin	56 (40.6)
NSAID	55 (39.9)
Acetaminophen	42 (30.4)
Duloxetine	30 (21.7)
Cannabis	17 (12.3)
Tricyclic antidepressant	14 (10.1)
Baclofen	11 (8.0)
Venlafaxine	8 (5.8)
Cyclobenzaprine	5 (3.6)
High-risk medications used, *n* (%)*‡	
Gabapentin/pregabalin	56 (40.6)
Benzodiazepine	46 (33.3)
Zopiclone	19 (13.8)
Cannabis	17 (12.3)
Tricyclic antidepressant	14 (10.1)
Referral source, *n* (%)	
Physician	84 (60.9)
Self-referral	30 (21.7)
Nurse practitioner	9 (6.5)
Pharmacist	6 (4.3)
Physical therapist	6 (4.3)
Other health professional§	3 (2.2)
Mean pain assessment scores**	
Brief Pain Inventory ($n = 116$)	6.7
Brief Pain Inventory Interference ($n = 110$)	7.5
Pain Catastrophizing Scale ($n = 107$)	25.0

*Percentages add up to more than 100 because multiple items may apply to one patient.
†Percentages do not add up to 100 because not all patients were taking opioids at baseline and because multiple items may apply to one patient.
‡Defined as medications that increase the risk of opioid-related harm when taken concomitantly.
§Client care coordinator, occupational therapist, registered nurse.
**Pain measures were not collected for all 138 patients during their initial appointment.

goals, is reported in Table 4 and describes a cohort of patients who moved toward the Action stage. Pain severity scores were very infrequently measured at follow-up appointments as part of normal care and therefore could not be compared with the baseline pain severity scores measured at the initial appointment (Table 1).

TABLE 2 Change in nonopioid adjunctive pain medication use

Drug	New starts, *n*	Discontinuations, *n*	Dose increases, *n*	Dose reductions, *n*
Acetaminophen	4	0	0	0
Baclofen	0	0	0	0
Cannabis	1	1	1	0
Cyclobenzaprine	1	0	0	0
Duloxetine	3	0	0	0
Gabapentin/pregabalin	6	4	11	11
NSAID	5	0	0	0
Tricyclic antidepressant	2	0	0	0
Venlafaxine	1	0	0	0

TABLE 3 Changes in high-risk medication use

Drug	New starts, *n*	Discontinuations, *n*	Dose increases, *n*	Dose reductions, *n*
Baclofen	0	0	0	0
Benzodiazepine	4	7	2	1
Cannabis	1	1	1	0
Cyclobenzaprine	1	0	0	0
Gabapentin/pregabalin	6	4	11	11
Tricyclic antidepressant	2	0	0	0
Zopiclone	3	1	1	2

High-risk medication were defined as medications that increase the risk of opioid-related harm when taken concomitantly.

TABLE 4 Stages of change

Stage	Baseline, *n* (%)*	Final follow up, *n* (%)†
Resistant to change	7 (5.1)	5 (3.8)
Precontemplative	25 (18.2)	13 (9.8)
Contemplation	41 (30.0)	25 (18.8)
Preparation	9 (6.5)	6 (4.5)
Preparation/determination	19 (13.9)	10 (7.5)
Determination	1 (0.7)	1 (0.7)
Action	35 (25.5)	73 (54.9)

*Total count does not equal 138 because data were missing for 1 patient.
†Total count does not equal 138 because data were missing for 5 patients.

Discussion

Previous research has consistently documented the clinical and health system benefits of ICPCs. The results of this retrospective, observational study add valuable new data to the existing literature. The positive changes in opioid use (i.e., lower MME doses and switches to buprenorphine/naloxone) and the corresponding improvements in patient overall health status provide evidence that the unique pharmacist-led, interprofessional model of care used by the UCPC may offer a viable alternative to the traditional physician-led, interprofessional model.

The changes in opioid use observed in this study suggest that the UCPC team was able to shift patients toward safer chronic medication regimens that are less likely to lead to opioid toxicity and unintended overdose, both of which are well-documented concerns in people living with chronic pain. The most significant result is the finding that almost 1 in 4

patients referred to the UCPC on a traditional opioid were switched to buprenorphine/naloxone to treat their chronic pain. Buprenorphine is known to have fewer side effects than traditional opioids, with similar or better efficacy in chronic pain management, because it can provide benefit for opioid-induced hyperalgesia and has substantially less risk of fatal overdose.[7] It is also noteworthy that the daily MME doses were significantly reduced among patients who were not switched to buprenorphine/naloxone. Previous research suggests that a reduction of 41.7 mg/d of morphine, which was observed in this study, correlates with a reduced risk of opioid-related toxicity.[8] Considering that unintended opioid-related overdose deaths in Canada have been increasing at an alarming rate in recent years, these findings suggest that the UCPC may improve the safety of patients with chronic pain.

It is unfortunate that this study could not provide clear data regarding improvement in patients' chronic pain severity. Routine use of measurement-based care tools in the treatment of chronic pain is challenging. Traditional pain severity scores (e.g., the Brief Pain Inventory [BPI]) may be unreliable markers for measuring changes in chronic pain over time because individual patients' pain severity can fluctuate dramatically throughout each day or even each hour due to the complex interplay of physical, psychosocial and emotional factors. Additionally, although measurement-based care tools such as the BPI provide objectivity to the assessment of an otherwise subjective condition, such as chronic pain, they have several barriers that may limit their practicality, including variability in patient interpretation of the scales, focus primarily on "pain" versus other accompanying experiences and sensations and time required for completion.[9,10] Thus, global rating scales of improvement have been suggested as a means to assess the overall experiences of participants in chronic pain studies, including pain relief, improvement in physical and emotional functioning and treatment side effects.[11] In addition to the reasons outlined above, the UCPC team selected the CGI-I, a single-item tool used to quantify the overall change in a patient's global health status, as the primary marker of treatment response because it is quick to complete and does not affect patient care processes, as no direct questions are asked of the patient aside from those required for routine care. CGI-I scale data reported in this study suggest that on average, patients experienced "minimal improvement" in their chronic pain 6 months after their initial UCPC appointment. Considering how challenging it is to make clinical improvements for individuals living with chronic pain, this result provides additional support for the positive impact of the UCPC on patient global functioning, especially when coupled with the data on improved medication safety.

The shift in patients' readiness to make the changes required to achieve their individualized goals, using the Transtheoretical Model (Stages of Change) and reported in Table 4, provides a clue to the possible long-term impact of the UCPC interventions. More than twice as many people reported being in the Action stage 6 months after their initial appointment, offering a glimpse into future changes that these patients may be willing to make. In a patient population known to be highly resistant to change, this is a potentially important marker of the impact of the UCPC.

This study has several limitations that should be considered when interpreting the results. The retrospective, observational nature of the study design makes it impossible to prove causation regarding the results that are reported. The 6-month follow-up time frame that was used, although typical in studies of chronic pain management and practical, considering the time-limited nature of most chronic pain clinics, also makes it difficult to determine whether the changes observed in this study will be sustained long-term. The relatively small sample size and the fact that the study took place in a single clinical site suggest that the results may not translate broadly to other regions of the world, especially those with different patient populations and dissimilar health systems.

Conclusion

The pharmacist-led interprofessional model of care used by the UCPC resulted in statistically significant and clinically meaningful changes in opioid use, along with data regarding improvement in overall patient health status and willingness to make future changes to achieve individualized goals. This is important information that suggests this unique team-based model for chronic pain management may be a viable alternative to the existing physician-led model of ICPC care that is commonly used internationally. Future research should attempt to capture the experiences of UCPC patients and their referring health providers along with longer-term clinical outcomes using a randomized, controlled study design. ■

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