



Prioritizing a sequence of short-duration groups as the standardized pathway for chronic noncancer pain at an Australian tertiary multidisciplinary pain service: preliminary outcomes

Hema Rajappa^{a,*}, Michelle Wilson^a, Ruth White^a, Megan Blanchard^b, Hilarie Tardif^b, Chris Hayes^a

Abstract

Objective: To describe implementation and report preliminary outcomes of a resource-efficient, standardized group pathway for chronic noncancer pain.

Design: Descriptive cross-sectional study of a group-based pain management pathway in comparison with an Australasian benchmarking data set.

Setting: An Australian tertiary multidisciplinary pain service.

Subjects: Patients with chronic noncancer pain actively participating in the group pathway in 2016.

Methods: Referred patients were prioritized to a short-duration group-based standardized pain management pathway linking education, assessment, and treatment groups. Measures of pain, mood, self-efficacy, and catastrophizing and reduction in daily opioid use were collated from the Australasian data set.

Results: In 2016, 928 patients were actively engaged with the pain service. More patients were prioritized to receive treatment in a group format in comparison with other Australasian services (68.4% vs 22%). A greater percentage of patients attended their first clinical contact within 3 months of referral (81.4%) compared with the Australasian average (68.6%). Comparable improvements in average pain intensity, pain interference, depression, anxiety, stress, pain catastrophizing, and self-efficacy were observed. There was significantly greater reduction in opioid use, including for those taking more than 40 mg of oral morphine equivalent daily dose.

Conclusion: Implementation of a sequence of short-duration groups as the default clinical pathway resulted in shorter waiting times and noninferior outcomes in key areas for patients completing the program, compared with Australasian averages. Given the resource efficiencies of the group process, this finding has implications for service design.

Keywords: Group process, Pain management, Model of care, Persistent pain

Sponsorships or competing interests that may be relevant to content are disclosed at the end of this article.

^a Hunter Integrated Pain Service, Hunter New England Health, Newcastle, New South Wales, Australia, ^b Electronic Persistent Pain Outcomes Collaboration (ePPOC), Australian Health Services Research Institute (AHSRI), University of Wollongong, Wollongong, New South Wales, Australia

*Corresponding author. Address: Hunter Integrated Pain Service, Locked Bag 1, Hunter Region Mail Center, Newcastle, New South Wales 2310, Australia. Tel.: +61249223435; fax: +61249855045. E-mail address: hema.rajappa@health.nsw.gov.au (H. Rajappa).

Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's Web site (www.painrpts.com).

Copyright © 2019 The Author(s). Published by Wolters Kluwer Health, Inc. on behalf of The International Association for the Study of Pain. This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike License 4.0 (CC BY-NC-SA) which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

PR9 4 (2019) e780

<http://dx.doi.org/10.1097/PR9.0000000000000780>

1. Introduction

The complexity and prevalence of chronic noncancer pain challenges existing models of service delivery. More than 80% of people experiencing chronic noncancer pain do not receive timely pain treatment, and this brings an associated risk of deterioration while waiting.^{26,40,47} The number of people with chronic noncancer pain in Australia is predicted to increase from 3.24 million in 2018 to 5.23 million in 2050.¹⁶ Current health care systems struggle to contain the costs of chronic pain, estimated at more than 200 billion Euros in Europe, 150 billion dollars in the United States, and 73.2 billion dollars in Australia per annum.^{16,57}

At public hospital tertiary pain centers in Australia, the traditional model of care has incorporated individual multidisciplinary assessment, followed by individual pain specialist led treatment as the usual pathway, with only select patients entering group treatment programs of varying duration.

The need for service redesign has been recognized worldwide, and various innovations trialed.^{9,13,22,29,35,36,55} The implementation of short preassessment education group sessions has led to reduction in wait times, early exposure to evidence-informed pain management, and patient familiarization with group-based treatment.^{6,12,24} Adaptations of this intervention are now commonplace in Australian public hospital pain services. The development of a group-based format for pain assessment with further efficiencies in resource utilization and patient flow was an additional innovation at Hunter Integrated Pain Service (HIPS).⁵⁰ The group assessment showed resource efficiency in reducing wait times by providing clinicians with the capacity to manage multiple patients simultaneously, and by reducing the impact of patient nonattendance compared with the individual format.

Based on this preliminary work, HIPS embarked on creating a resource-efficient, standardized management pathway that was entirely group-based, linking preassessment education, assessment, and treatment groups.

The content of all groups, from initial education to assessment to active treatment, emphasizes a whole person approach and the implementation of active self-management, rather than passively received treatment strategies.^{24,39,60} This aims to modify brain interpretation, wind down nervous system sensitization, and reduce pain intensity over time.

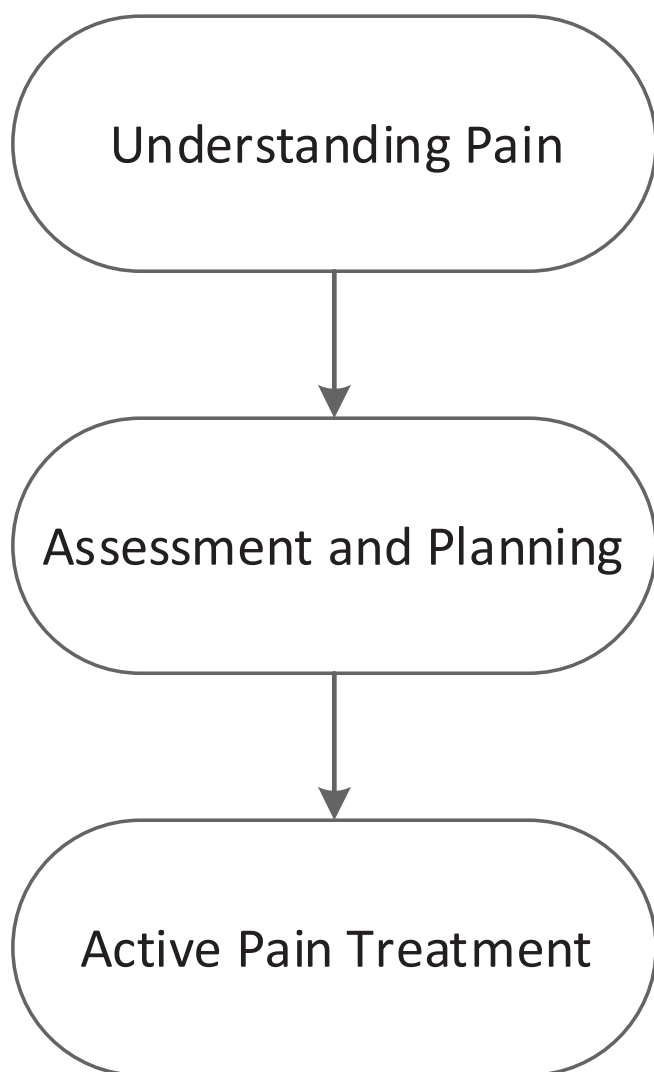


Figure 1. Hunter Integrated Pain Service standardized group pathway.

This study aims to describe the implementation of a standardized group pathway in terms of content and process. Preliminary outcome data are reported.

2. Methods

2.1. Subjects

Patients included in this cross-sectional study are those adults with chronic noncancer pain who participated in the standardized group pathway in 2016 (January 1, 2016–December 31, 2016), after referral to HIPS. Owing to the continuous nature of patient flow through the service, there were patients active in the pathway in 2016, whose initial engagement occurred the previous year. On the other hand, some patients referred during 2016 did not become active in the pathway until the following year and so were not included in the study.

In carefully selected cases, individual assessment and treatment was offered as a nonstandard option. This included those who were cognitively impaired, elderly (>75 years), severely disabled (eg, quadriplegic), or those identified in the referral as not appropriate for group participation (eg, deaf, blind, or non-English speaking). Patients initially participating in individual treatment could choose to enter the standardized group pathway. Requests from patients in the group pathway to switch to the individual pathway were considered on a case-by-case basis, in view of patient factors such as reports of excessive anxiety in group situations, previously unidentified visual or hearing impairments, or language barriers. The individual pathway outcomes are not reported in this study.

2.2. Data collection processes

The implementation of an Australasian chronic pain database, electronic Persistent Pain Outcomes Collaboration (ePPOC), has been reported previously.⁵⁴ Study data were primarily drawn from the 2016 ePPOC HIPS annual report. The ePPOC team based at the University of Wollongong collates nonidentifiable patient data submitted electronically by participating pain services across Australia and New Zealand. These data are then analyzed and provided to each service in midyear and annual reports. In 2016, ePPOC included data from 46 specialist pain services in Australia and New Zealand.

2.3. Questionnaires

Patients are requested to complete the ePPOC entry questionnaire after referral, and this is collected at their first appointment. The questionnaire includes demographic and baseline data for a battery of standardized assessment tools: Brief Pain Inventory, Depression, Anxiety, and Stress Scale (DASS21), Pain Catastrophizing Scale (PCS), and Pain Self-Efficacy Questionnaire (PSEQ).^{32,38,43,52,53} A brief description of each tool, interpretation of scores, and criteria to determine clinical significance of change in scores is provided in Appendix 1 (available as Supplemental digital content at <http://links.lww.com/PR9/A49>).¹⁸ Patients also received an ePPOC review questionnaire at completion of active treatment and at 3 months after their last clinical interaction with the service.

2.4. Statistics

Data were extracted from the ePPOC database into text files, then imported into SAS (version 9.4; SAS Institute, NC), to be statistically analyzed. This included comparison of clinically significant improvement on each assessment tool from referral to end of active treatment, for HIPS and other services. Reduction in daily opioid use and waiting times from referral to first contact

Table 1
Overview of groups.

| Group name | Type | Duration* | Frequency | Number invited | Target patient group size | Staffing | Next steps (X = option offered) | | | | |
|-------------------------|-----------------------------|---------------------------------------|---------------|----------------|---------------------------|----------------------------|---------------------------------|--------------------------------|---------------------------|---------------|-----------|
| | | | | | | | Progress as per pathway | Switch to individual pathway # | One-off individual review | Phone support | Discharge |
| Understanding pain | Education/Orientation group | 1 h 30 min session (one-off) | 1–2 per month | 60 | 18–25 | SPMP + one other clinician | X | X | | | X |
| Assessment and planning | Assessment group | 4 h 15 min session (one-off) | 2–4 per month | 13 | 6–8 | SPMP, CP, and PP | X | | X | X | X |
| Active pain treatment | Core treatment group | 21 h (6 × 3 h 30 min weekly sessions) | 14 per year | 20 | 8–10 | CP, PP, and CNS | X | | X | X | X |

* Breaks were 15 to 30 minutes and not included in duration.

CP, clinical psychologist; CNS, clinical nurse specialist; PP, pain physiotherapist; SPMP, specialist pain medicine physician.

were also compared. For both HIPS and other services, “n” varied depending on whether the questionnaire was returned and if an item was completed or if missing, imputable. For categorical data, the χ^2 test was used to test for difference in proportions. For continuous data, the *t* test was used to test for difference in mean values. *P* values less than 0.05 were considered statistically significant.

2.5. Missing data

Patients needed to complete a required number of items in the assessment tools for a subscale to be considered valid, with missing items imputed as the average of completed items for the DASS, PCS, and PSEQ subscales (see Appendix 1, available as Supplemental digital content at <http://links.lww.com/PR9/A49>).

2.6. Ethical approval and consent

Only patients who consented to their data being used for research purposes in the ePPOC entry and review questionnaires were included in this study.

Ethical approval to establish ePPOC and use the deidentified Australian data set for reporting and research purposes has been obtained through the Ethics Committee at University of Wollongong.

2.7. Overview of the group process

The standardized group pathway consisted of 3 sequential steps (Fig. 1). The first step was the education group titled, “Understanding Pain.” This was followed by the second step, which was a group assessment termed, “Assessment and Planning.” The third step was the core treatment group named, “Active Pain Treatment.” Patients were given the option of bringing a support person or carer to the first 2 steps. Patients followed this sequence of steps progressing through the pathway, but could exit at any step, resulting in treatment recommendations being sent to their referrer or general practitioner (GP). After completion of the group pathway, patients could choose further review with the service. The review and subsequent patient outcomes are beyond the scope of this article.

At each step of the pathway, there was an emphasis on expanding and reinforcing key messages from the previous step with supportive interactions between clinicians and patients. Appropriate and effective communication techniques were used, including empathy, validation, and motivational interviewing.^{1,7,19}

An environment conducive to behavior change was created and fostered.^{15,19}

Content of each group reflected current evidence and the requirement to target low health literacy.^{28,31,45,46,49,59} Cognitive and behavior change targets were identified in a collaborative fashion. At each step, clinicians and patients worked in partnership, towards identification and development of realistic and meaningful targets. These targets included reducing opioids, catastrophizing and pain interference, and increasing physical activity and pain self-efficacy. Patients had an active role in modifying and fine-tuning targets through their journey with the service.

Table 1 summarizes the details of each group of the standardized pathway.

2.8. Understanding Pain

After referral and triaging, most patients were invited to the first step in the standardized group pathway, Understanding Pain, which has been reported previously.²⁴ This preassessment education group ran in the form of an interactive seminar with multimedia presentation and opportunities for questions and comments. Content emphasized current pain neuroscience, neuroplasticity, a whole person approach and the transition from passively received medical treatments to active self-treatment. The content was available in digital format for ease of access to remotely situated patients.²⁷

For those who chose to progress beyond Understanding Pain, a secondary triage process occurred. This was based on any new information contained in the ePPOC referral questionnaire (routinely collected at Understanding Pain) or obtained through direct observation of or conversation with the patient at Understanding Pain. Most patients were invited to attend the next step in the group pathway, a multidisciplinary group pain assessment workshop titled “Assessment and Planning.”

2.9. Assessment and Planning

The resource requirements and content of this workshop have been reported in detail previously.⁵⁰ Throughout the day, patients were guided to perform their own structured self-assessment and developed a personalized pain recovery plan (Appendix 2, available as Supplemental digital content at <http://links.lww.com/PR9/A49>). The workshop was interactive and had an emphasis on expanding and reinforcing key messages from Understanding Pain, with supportive interactions between

Table 2**Outline of Active Pain Treatment Program (APT).**

| Week | Content summary (# = practical sessions) | Primary behavioral target/s |
|------|--|---|
| 1 | Introduction Goal setting Physical self-assessment Baseline activity level Daily walk 24-h activity and medication monitoring Medication awareness Mind–body link Home tasks | ↑ Valued physical/functional activity ↑ Daily walk time/speed of walking ↓ Opioid use/dose ↓ Opioid/other medication use related to chronic noncancer pain |
| 2 | Review of home tasks Pain beliefs 12-min walk# Review of video walk Upgrading by quota Catastrophizing Relaxation# Home tasks | ↑ Daily walk time/speed of walking ↑ Minutes engaged in moderate physical activity ↑ Use of helpful/positive self-talk ↑ Use of relaxation response skills |
| 3 | Review of home tasks Mindful movement# Pain science Sleep Relaxation# Assertive communication 12-min walk# Medication awareness Home tasks | ↑ Daily movement ↑ Daily use of sleep skills/optimize sleep ↑ Use of daily relaxation response skills ↑ Use of nonreactive communication skills ↑ Daily walk time/speed of walking ↓ Medication use related to chronic noncancer pain |
| 4 | Review of home tasks Relaxation# Pain science Flare-up planning Mindful movement# Strength# Upgrade plans Home tasks | ↑ Daily utilisation of relaxation response ↑ Use of movement/relaxation in all contexts, eg, flare-up ↑ Leg strength through graded exposure ↑ Daily walk time/speed of walking/other functional tasks |
| 5 | 12-min walk# Review of habit formation Timeline links Stress load Your story Sleep Food and inflammation Yoga# Setbacks Home tasks | ↑ Daily walk time/speed of walking ↑ Daily helpful/“approach” habits ↑ Psychological capability/resilience ↑ Use of optimal sleep skills, eg, sleep restriction if insomnia present ↑ Fruit and vegetable intake ↑ Function through new activity, eg, mindful yoga ↓ Rest as a strategy/↓ sedentary behaviors |
| 6 | 12-min walk# Review of habit formation Relaxation# Physical reassess Yoga# Update pain recovery plan Goal setting | ↑ Daily walk time/speed of walking ↑ Daily helpful/“approach” habits ↑ Daily relaxation response ↑ New activities with pain, eg, mindful yoga ↑ Planned approach to pain and goal directed behavior |

pain-related medication and accessing community psychology services.

Patients identified as taking more than 100 mg of oral morphine equivalent daily dose or taking medications associated with significant health risks were offered a brief individual medication review with the specialist pain medicine physician. The patient’s prescription medication was discussed, and a medication plan, which may have included a deprescribing regimen, was negotiated with the patient’s active participation. A copy of the pain recovery plan, team report, and medication plan (if applicable) was forwarded to the referrer.

2.10. Active Pain Treatment

The final step in the standardized group pathway was attendance at a core treatment group called “Active Pain Treatment,” with a duration of 21 hours over 6 weeks.

This 6-week group program, conducted 1 day every week, was facilitated by a clinical psychologist, a pain physiotherapist, and a clinical nurse specialist. The core treatment program reinforced a whole person approach, addressing 5 domains of pain management: biomedical, mindbody, connection, activity, and nutrition.²⁵ Implementation of active self-management, with reduced reliance on passive strategies including pain-related medications, was encouraged.⁴¹ The Explain Pain model was used to discuss the neuroscience of chronic pain.³⁹ Psychological elements of this program were mainly based on cognitive behavioural therapy with inclusion of mindfulness-based strategies.^{20,48,56} Components included reframing of dysfunctional cognitions, enabling adaptive behaviors and graded task assignments to enhance functioning. The contribution of social disconnection to pain experience in participants and ways to re-establish connection to people, purpose, and place was explored.⁵¹ Gradual grading up of physical activities from baseline, incorporating pacing strategies, and mindful movement were important components of the physical activity domain of pain management.^{23,42} Participants were also invited to review their diet and anthropometric measures and make healthier food choices to improve overall wellbeing.^{3,4}

A brief outline of the program, including the primary behavioral targets, is outlined in **Table 2**. Patients were given simple written resources on active treatment strategies developed and updated regularly in line with current evidence regarding pain.

The clinical nurse specialist facilitated sessions on pain-related medications and nutrition. Options of further medication input, in person or over the phone, with the clinical nurse specialist were also offered. Another alternative offered was a phone consultation between the specialist pain medicine physician and the GP.

The importance of regular weekly attendance was emphasized, and limited catch-up options were available for missed sessions. On the final week of the Active Pain Treatment group, patients reviewed and updated their pain recovery plan created at Assessment and Planning.

2.11. Patient–clinician phone interactions

For all groups except Understanding Pain, patients received a preparatory phone call. A staff member checked on patient readiness to attend, current pain medications and answered any questions regarding the group.

After referral, at any step, patients were able to phone for support during working hours. This support included reviewing progress and discussing challenges, including those related to medication deprescribing.

clinicians and patients. Patients also received a manual summarizing the content of the workshop and had the opportunity to collect printed information on topics such as

Table 3
Staffing at HIPS.

| Position | Full time equivalent (FTE) (1 FTE = 40 hours per week) |
|--|---|
| Specialist pain medicine physicians | 1.6 |
| Pain medicine trainee fellows | 1.0 |
| Clinical nurse consultants/specialists | 1.7 |
| Psychiatrists | 0.4 |
| Clinical psychologists | 1.4 |
| Pain physiotherapists | 1.6 |
| Administrative staff | 3.4 |

HIPS, Hunter Integrated Pain Service.

2.12. Staff resource requirements for group interventions

The clinical staff facilitating groups consisted of a mix of specialist pain medicine physicians, pain medicine trainees, clinical nurse specialists, clinical psychologists, and pain physiotherapists. **Table 3** details the entire 2016 staffing levels at HIPS, whereas **Table 1** includes details of staffing for each step of the group pathway.

3. Results

3.1. Patient flow through the service

In 2016, 928 patients were actively engaged with HIPS, compared with 15,862 for other services (**Table 4**). During the same period, HIPS received 1192 patient referrals. The number of patients going through various steps in the group pathway in the same period was 690, 278, and 92 patients for steps 1, 2, and 3, respectively. As previously explained, this was not a cohort due to the continuous nature of patient flow through the service.

Approximately 68.4% of HIPS patients were seen solely through the group format, as compared to 22% of those attending groups with other services. A higher percentage of HIPS patients attended their first clinical contact within 3 months of referral compared with other services (81.4% vs 68.6%, $P < 0.001$).

3.2. Demographics of patient population

The 2016 ePPOC data showed HIPS patients at referral had a similar patient profile to other services with some important differences, which were clinically and statistically significant (**Table 4**). More patients attending HIPS identified as being indigenous, needed assistance with communication, took opioids more than twice a week, and had experienced pain for more than 5 years. Hunter Integrated Pain Service patients had a higher proportion of patients who were unemployed due to pain. The average number of associated comorbidities was higher in the HIPS population, and although this difference was statistically significant, it is unlikely to be clinically significant. Only 0.2% of HIPS patients required an interpreter compared with 5.4% for other services. Baseline characteristics including sex, average age, opioid dose, number of drug groups used, and number of sites of pain were similar in both populations.

3.3. Standardized assessment tools at referral

When comparing results from standardized assessment tools at referral, average pain severity was lower in HIPS compared with other services, and this was statistically significant, although unlikely to be clinically significant (6.2 vs 6.4). There was no statistically significant difference between HIPS patients and those attending other services with regards to the other assessment tools (**Table 5**).

3.4. Patient outcomes

In those patients who scored in the moderate/severe/extremely severe categories of standardized assessment tools (Brief Pain Inventory, DASS21, PCS, and PSEQ) at referral, there were no statistically significant differences in the proportion of patients making clinically significant improvement over time between HIPS and other services (**Table 6**).

A higher proportion of HIPS patients achieved a 50% or greater than 50% reduction in opioid use at end of treatment compared with other services. The difference in proportions was statistically significant for all patients on opioids as well as the subgroup of patients on 40 mg or more oral morphine equivalent daily dose at referral.

Table 4
Patient demographics at referral.

| Demographic information at referral | HIPS (n) | Other services (n) | P |
|---|-------------|--------------------|--------|
| Gender (female) | 58.5% (928) | 58.4% (15862) | 0.942 |
| Average age (y) | 51.3 (928) | 51.1 (15862) | 0.780 |
| Interpreter required | 0.2% (914) | 5.6% (14995) | <0.001 |
| Communication assistance required | 12.2% (920) | 9.4% (14510) | 0.003 |
| Indigenous status | 8.3% (885) | 3.8% (13195) | <0.001 |
| Average number of pain sites | 4.0 (923) | 3.9 (14465) | 0.131 |
| Average number of comorbidities | 2.5 (767) | 2.3 (11648) | <0.001 |
| Opioid use >2 d/wk | 66.4% | 58.3% | <0.001 |
| Average daily morphine equivalent (mg)* | 71.3 (373) | 70.3 (5071) | 0.830 |
| Average number of drug groups used | 2.6 (544) | 2.6 (8406) | 0.984 |
| Unemployment due to pain | 39.7% (552) | 33.5% (10763) | 0.003 |
| Experiencing pain >5 y | 51.1% (849) | 43.5% (14178) | <0.001 |

* For those patients taking opioids.
HIPS, Hunter Integrated Pain Service.

Table 5**Patient assessment tool scores at referral.**

| Assessment tool scores at referral | | | |
|------------------------------------|------------|--------------------|--------|
| Domain | HIPS (n) | Other services (n) | P |
| Pain severity | 6.2 (530) | 6.4 (10673) | 0.0384 |
| Pain interference | 7.1 (571) | 7.0 (10946) | 0.3868 |
| Depression | 19.8 (553) | 20.2 (10685) | 0.5660 |
| Anxiety | 13.7 (529) | 14.1 (10651) | 0.4104 |
| Stress | 20.8 (549) | 21.0 (10621) | 0.7473 |
| Pain catastrophizing | 28.6 (546) | 29.4 (10550) | 0.1859 |
| Pain self-efficacy | 21.9 (556) | 20.8 (10732) | 0.0543 |

HIPS, Hunter Integrated Pain Service.

4. Discussion

The standardized group pathway aims for the best possible patient outcomes while maximizing efficient utilization of finite staff resources.

Population profile was similar at baseline between HIPS and other services, except for some differing vulnerabilities in the HIPS population (higher indigenous status and communication

difficulties and lower need for interpreter). Despite this, clinical outcomes were noninferior, and there were lower wait times. It was also noted that greater opioid reduction was achieved.

Utilization of the HIPS group pathway facilitates exposure of an increased number of patients to group intervention. There is a theoretical risk of poorer pathway outcomes from using group education and assessment, as opposed to individual (due to dilution of personal contact time and reduced emphasis on individual patient selection). However, this study affirms that it is possible to achieve noninferior patient-related outcomes as compared to other services, while facilitating increased numbers of patients through a standardized, short-duration group pathway.

An early invite to the initial large group, Understanding Pain, offers a timely and potentially therapeutic interaction to a high number of patients and their support persons. It minimizes waiting times, introduces patients to a group setting, and allows for the option of an early discharge.^{12,24}

Undertaking assessment in a short-duration group workshop, the second step in the standardized group pathway, is resource-efficient as it can be overbooked, unlike individual assessment.^{14,50,61} This helps to counter the problem of patient nonattendance, which is well known in most chronic conditions,

Table 6**Patient outcomes measured by change in assessment tool scores and opioid use.**

| Outcome measures | HIPS | Other services | P |
|---|-----------------|-------------------|--------|
| BPI average pain Patients with moderate or severe average pain at referral making clinically significant improvement at end of treatment | 29.09% (n = 55) | 24.96% (n = 1354) | 0.4890 |
| BPI pain interference Patients with moderate or severe pain interference at referral making clinically significant improvement at end of treatment | 59.70% (n = 67) | 56.83% (n = 1450) | 0.6423 |
| DASS21 depression Patients with moderate, severe, or extremely severe depression at referral making clinically significant improvement at end of treatment | 56.25% (n = 48) | 50.24% (n = 1041) | 0.4155 |
| DASS21 anxiety Patients with moderate, severe, or extremely severe anxiety at referral making clinically significant improvement at end of treatment | 36.59% (n = 41) | 39.44% (n = 928) | 0.7142 |
| DASS21 stress Patients with moderate, severe, or extremely severe stress at referral making clinically significant improvement at end of treatment | 50.00% (n = 42) | 52.15% (n = 884) | 0.7853 |
| PCS total Patients with high or severe pain catastrophizing at referral making clinically significant improvement at end of treatment | 62.75% (n = 51) | 52.64% (n = 1136) | 0.1572 |
| PSEQ total Patients with moderate or severe pain interference at referral making clinically significant improvement at end of treatment | 54.72% (n = 53) | 47.66% (n = 1284) | 0.3138 |
| oMEDD reduced by 50% or more for all patients taking opioid medication at referral | 65.96% (n = 47) | 45.59% (n = 669) | 0.0068 |
| oMEDD reduced by 50% or more for patients taking 40 mg + opioid medication at referral | 61.29% (n = 31) | 39.57% (n = 326) | 0.0190 |

BPI, Brief Pain Inventory; oMEDD, oral morphine equivalent daily dose; HIPS, HIPS, Hunter Integrated Pain Service; PCS, Pain Catastrophizing Scale; PSEQ, Pain Self-Efficacy Questionnaire.

including pain.^{21,37,44} The group assessment has shown comparable clinical outcomes with individual assessment.⁵⁰

There is no consensus within the pain field regarding optimal duration of pain treatment groups. Long-duration groups in Australia are up to 120 hours.⁵ Typically, such long-duration groups are offered to smaller numbers of more highly selected patients, often with compensable funding status. From a service design perspective, the potentially greater improvement of individuals undertaking a long-duration group is offset by the restrictions in access that necessarily apply.

The duration of 21 hours over 6 weeks was based on clinician and patient feedback obtained after core pain treatment groups of varying durations that HIPS had run in the past. The rationale for this included patient acceptability, effective utilization of clinician time, and adequate time for participants to practice active strategies and problem solve pain-related issues. The HIPS team attempts to reverse the passive passenger role, reinforced through years of traditional health care interactions.^{8,11,30}

Burke et al.⁵ define the duration of such a program to be low (<30 hours) compared with the Australian average of 68.6 hours. Further research, including analysis of ePPOC data, will enable identification of the “sweet spot” in optimizing the resources required to achieve acceptable clinical results, recognizing that the ideal results to resource ratio may vary across different clinical contexts.

Hunter Integrated Pain Service standardized group pathway is an example of a triaging model of care. Although this study was a cross-sectional study and not a cohort study, the decreased number of patients attending the active treatment stage or final step of group pathway suggests a process of funneling of patients. Those patients most ready to change and needing further support engage in active treatment.^{30,33,34,58} The resource-efficient design of the model allows for prioritization of finite resources, honors patient decision-making, and values clinician effort.

Low literacy is a wide-reaching problem in health care.² Communication techniques and educational strategies tailored to behavior change and low literacy are imbedded consistently and deliberately throughout HIPS standardized group pathway. All written material was designed for fifth to sixth grade readability, with educational aids such as tick boxes and incorporating short active sentences.^{10,17,45,59}

Ongoing open line of telephone communication and support between the service and patient/GP was designed to decrease need for frequent in-person consults and also guarded against therapeutic relapse.

4.1. Limitations

There are a number of study limitations. First, the study did not measure outcomes for those patients entering the nonstandard individual pathway which precluded comparison of outcomes with those entering the standardized pathway. Furthermore, outcomes were only measured after Active Pain Treatment, the third step in the standardized group pathway. Measuring outcomes after each step of the pathway would have allowed analysis of any additive therapeutic benefit for each step. Another shortcoming of the study was the inability to differentiate between those who leave the pathway positively because of good therapeutic progress as opposed to those who disengage, without such progress.

It is envisaged that this article will provide a foundation for further exploring models of chronic pain management, with comparison of outcomes from individual and group pathways as an important focus. In addition, analysis of the impact of patient

complexity on progression through the group pathway may inform more individually tailored programs. This would be especially important for those identifying as indigenous, to ensure cultural differences are respected and addressed appropriately.

5. Conclusions

Hunter Integrated Pain Service promotes short-duration groups as the standard intervention for patients experiencing chronic noncancer pain. This is efficient in terms of team resource utilization and exposure of patients to evidence-based care. Outcome data were noninferior for this standardized, sequenced, short-duration group pathway, as compared to other services whose data were typically based on more individualized assessment and treatment and often, longer-duration groups. This model has implications for other pain services that are resource-limited and have lengthy waitlists.

Disclosures

The authors have no conflict of interest to declare.

Acknowledgments

The authors acknowledge the considerable and enthusiastic contribution of all members of HIPS towards implementation of the model of care reported.

Appendix A. Supplemental digital content

Supplemental digital content associated with this article can be found online at <http://links.lww.com/PR9/A49>.

Article history:

Received 28 May 2019

Received in revised form 16 July 2019

Accepted 22 July 2019

References

- [1] Alperstein D, Sharpe L. The efficacy of motivational interviewing in adults with chronic pain: a meta-analysis and systematic review. *J Pain* 2016;17:393–403.
- [2] Berkman ND, Sheridan SL, Donahue KE, Halpern DJ, Crotty K. Annals of internal medicine review low health literacy and health outcomes: an updated. *Ann Intern Med* 2014;155:97–107.
- [3] Brain K, Burrows TL, Rollo ME, Chai LK, Clarke ED, Hayes C, Hodson FJ, Collins CE. A systematic review and meta-analysis of nutrition interventions for chronic noncancer pain. *J Hum Nutr Diet* 2019;32:198–225.
- [4] Brain K, Burrows TL, Rollo ME, Hayes C, Hodson FJ, Collins CE. The effect of a pilot dietary intervention on pain outcomes in patients attending a tertiary pain service. *Nutrients* 2019;11:E181.
- [5] Burke AL, Denson LA, Mathias JL, Hogg MN. An analysis of multidisciplinary staffing levels and clinical activity in Australian tertiary persistent pain services. *Pain Med* 2015;16:1221–37.
- [6] Burke AL, Denson LA, Mathias JL. Does a brief educational session produce positive change for individuals waiting for tertiary chronic pain services? *Pain Med* 2016;17:2203–17.
- [7] Canovas L, Carrascosa AJ, Garcia M, Fernandez M, Calvo A, Monsalve V, Soriano JF; Empathy Study Group. Impact of empathy in the patient-doctor relationship on chronic pain relief and quality of life: a prospective study in Spanish pain clinics. *Pain Med* 2018;19:1304–14.
- [8] Chunchu K, Mauksch L, Charles C, Ross V, Pauwels J. A patient centered care plan in the EHR: improving collaboration and engagement. *Fam Syst Health* 2012;30:199–209.
- [9] Clark TS. Interdisciplinary treatment for chronic pain: is it worth the money? *Proc (Bayl Univ Med Cent)* 2000;13:240–3.
- [10] Coulter A, Safran D, Wasson JH. On the language and content of patient engagement. *J Ambul Care Manag* 2012;35:78–9.

- [11] Coulter A. Patient engagement—what works? *J Ambul Care Manage* 2012;35:80–9.
- [12] Davies S, Quintner J, Parsons R, Parkitny L, Knight P, Forrester E, Roberts M, Graham C, Visser E, Antill T, Packer T, Schug SA. Preclinical group education sessions reduce waiting times and costs at public pain medicine units. *Pain Med* 2011;12:59–71.
- [13] Davies SJ, Hayes C, Quintner JL. System plasticity and integrated care: informed consumers guide clinical reorientation and system reorganization. *Pain Med* 2011;12:4–8.
- [14] Davies S. Evolving pain services: preclinic groups speed assessment and lower costs. *Pain Med* 2016;17:211.
- [15] Davis R, Campbell R, Hildon Z, Hobbs L, Michie S. Theories of behaviour and behaviour change across the social and behavioural sciences: a scoping review. *Health Psychol Rev* 2015;9:323–44.
- [16] Deloitte Access Economics. The cost of pain in Australia 2019: Commissioned by Pain Australia. Available at: <https://www2.deloitte.com/au/en/pages/economics/articles/cost-pain-australia.html>. Accessed July 15, 2019.
- [17] Dewalt DA, Berkman ND, Sheridan S, Lohr KN, Pignone MP. Literacy and health outcomes: a systematic review of the literature. *J Gen Intern Med* 2004;19:1228–39.
- [18] Dworkin RH, Turk DC, Wyrwich KW, Beaton D, Cleeland CS, Farrar JT, Haythornthwaite JA, Jensen MP, Kerns RD, Ader DN, Brandenburg N, Burke LB, Cella D, Chandler J, Cowan P, Dimitrova R, Dionne R, Hertz S, Jadad AR, Katz NP, Kehlet H, Kramer LD, Manning DC, McCormick C, McDermott MP, McQuay HJ, Patel S, Porter L, Quessy S, Rappaport BA, Rauschkolb C, Revicki DA, Rothman M, Schmader KE, Stacey BR, Stauffer JW, von Stein T, White RE, Witter J, Zavisic S. Interpreting the clinical importance of treatment outcomes in chronic pain clinical trials: IMMPACT recommendations. *J Pain* 2008;9:105–21.
- [19] Edmond SN, Keefe FJ. Validating pain communication: current state of the science. *PAIN* 2015;156:215–9.
- [20] Ehde DM, Dillworth TM, Turner JA. Cognitive-behavioral therapy for individuals with chronic pain: efficacy, innovations, and directions for research. *Am Psychol* 2014;69:153–66.
- [21] Fitzmaurice B, Rogan A, Wong T, Akhtar S, Rayen A. Why do patients miss and cancel their chronic pain management appointments? *Internet J Anesthesiol* 2015;34:1–7.
- [22] Gatchel RJ, McGeary DD, McGeary CA, Lippe B. Interdisciplinary chronic pain management: past, present, and future. *Am Psychol* 2014;69:119–30.
- [23] Geneen LJ, Moore RA, Clarke C, Martin D, Colvin LA, Smith BH. Physical activity and exercise for chronic pain in adults: an overview of Cochrane Reviews. *Cochrane Database Syst Rev* 2017:CD011279.
- [24] Hayes C, Hodson FJ. A whole-person model of care for persistent pain: from conceptual framework to practical application. *Pain Med* 2011;12:1738–49.
- [25] Hayes C, Naylor R, Egger G. Understanding chronic pain in a lifestyle context: the emergence of a whole-person approach. *Am J Lifestyle Med* 2012;6:421–8.
- [26] Hogg MN, Gibson S, Helou A, DeGabelle J, Farrell MJ. Waiting in pain: a systematic investigation into the provision of persistent pain services in Australia. *Med J Aust* 2012;196:386–90.
- [27] Hunter integrated pain service—understanding pain. Available at: <http://www.hnehealth.nsw.gov.au/Pain/Pages/Understanding-Pain.aspx>. Accessed July 15, 2019.
- [28] Jayasinghe UW, Harris MF, Parker SM, Litt J, van Driel M, Mazza D, Del Mar C, Lloyd J, Smith J, Zwar N, Taylor R; Preventive Evidence into Practice Partnership Group. The impact of health literacy and life style risk factors on health-related quality of life of Australian patients. *Health Qual Life Outcomes* 2016;14:68.
- [29] Jones TL S, Moore T. Effects of a single session group intervention for pain management in chronic pain patients: a pilot study. *Pain Ther* 2013;2:57–64.
- [30] Jordan JE, Briggs AM, Brand CA, Osborne RH. Enhancing patient engagement in chronic disease self-management support initiatives in Australia: the need for an integrated approach. *Med J Aust* 2008;189:9–13.
- [31] Loke YK, Hinz I, Wang X, Rowlands G, Scott D, Salter C. Impact of health literacy in patients with chronic musculoskeletal disease—systematic review. *PLoS One* 2012;7:e40210.
- [32] Lovibond SH, Lovibond PF. Manual for the depression anxiety stress scale. Sydney: Psychology Foundation, 1995.
- [33] Martin CM, Peterson C. Improving chronic illness care-revisiting the role of care planning. *Aust Fam Physician* 2008;37:161–4.
- [34] Martin CM. Chronic disease and illness care: adding principles of family medicine to address ongoing health system redesign. *Can Fam Physician* 2007;53:2086–91.
- [35] McGeary DD, McGeary CA, Gatchel RJ. A comprehensive review of telehealth for pain management: where we are and the way ahead. *Pain Pract* 2012;12:570–7.
- [36] McGeary D, McGeary C, Peterson A, Gatchel R. Healthcare utilization after interdisciplinary chronic pain treatment: Part II. Preliminary examination of mediating factors in the use of costly healthcare interventions. *J Appl Biobehavioral Res* 2013;18:24–36.
- [37] Mitchell A, Selmes T. Why don't patients attend their appointments? Maintaining engagement with psychiatric services. *Adv Psychiatr Treat* 2007;13:423–34.
- [38] Modified Brief Pain Inventory, reproduced with acknowledgement of the pain research group, University of Texas. Vol. 2019. MD Anderson Cancer Centre. Available at: <https://www.mdanderson.org/research/departments-labs-institutes/departments-divisions/symptom-research/symptom-assessment-tools/brief-pain-inventory.html>. Accessed August 21, 2019.
- [39] Moseley GL, Butler DS. Fifteen years of explaining pain: the past, present, and future. *J Pain* 2015;16:807–13.
- [40] National Strategic Action Plan for Pain Management. Developed by Pain Australia. Commonwealth of Australia. 2019, pp. 4–6. Available at: <https://www.painaustralia.org.au/static/uploads/files/national-action-plan-11-06-2019-wftmzrzushlj.pdf>. Accessed August 21, 2019.
- [41] Nicholas MK, Blyth FM. Are self-management strategies effective in chronic pain treatment? *Pain Manag* 2016;6:75–88.
- [42] Nicholas MK, George SZ. Psychologically informed interventions for low back pain: an update for physical therapists. *Phys Ther* 2011;91:765–76.
- [43] Nicholas MK. Self-efficacy and chronic pain. Proceedings of the annual conference of the British Psychological Society, St. Andrews, Scotland, 1989.
- [44] Odonkor CA, Christiansen S, Chen Y, Sathiyakumar A, Chaudhry H, Cinquegrana D, Lange J, He C, Cohen SP. Factors associated with missed appointments at an academic pain treatment center: a prospective year-long longitudinal study. *Anesth Analg* 2017;125:562–70.
- [45] Paasche-Orlow MK, Schillinger D, Greene SM, Wagner EH. How health care systems can begin to address the challenge of limited literacy. *J Gen Intern Med* 2006;21:884–7.
- [46] Pignone M, DeWalt DA, Sheridan S, Berkman N, Lohr KN. Interventions to improve health outcomes for patients with low literacy. A systematic review. *J Gen Intern Med* 2005;20:185–92.
- [47] Schatman ME. Interdisciplinary chronic pain management: international perspectives. In: Ballantyne JC, editor. *IASP: Pain clinical update*. Vol. 20. 2012.
- [48] Schutze R, Rees C, Smith A, Slater H, Campbell JM, O'Sullivan P. How can we best reduce pain catastrophizing in adults with chronic noncancer pain? A systematic review and meta-analysis. *J Pain* 2018;19:233–56.
- [49] Smith SG, Curtis LM, Wardle J, von Wagner C, Wolf MS. Skill set or mind set? Associations between health literacy, patient activation and health. *PLoS One* 2013;8:e74373.
- [50] Smith N, Jordan M, White R, Bowman J, Hayes C. Assessment of adults experiencing chronic non-cancer pain: a randomized trial of group versus individual format at an Australian tertiary pain service. *Pain Med* 2016;17:278–94.
- [51] Sturgeon JA, Dixon EA, Darnall BD, Mackey SC. Contributions of physical function and satisfaction with social roles to emotional distress in chronic pain: a Collaborative Health Outcomes Information Registry (CHOIR) study. *PAIN* 2015;156:2627–33.
- [52] Sullivan MJL, Bishop SR, Pivik J. The pain catastrophizing Scale: development and validation. *Psychol Assess* 1995;7:524–32.
- [53] Tan G, Jensen MP, Thornby JI, Shanti BF. Validation of the brief pain inventory for chronic nonmalignant pain. *J Pain* 2004;5:133–7.
- [54] Tardif H, Arnold C, Hayes C, Eagar K. Establishment of the Australasian electronic persistent pain outcomes collaboration. *Pain Med* 2017;18:1007–18.
- [55] Theodore BR, Whittington J, Towle C, Tauben DJ, Endicott-Popovsky B, Cahana A, Doorenbos AZ. Transaction cost analysis of in-clinic versus telehealth consultations for chronic pain: preliminary evidence for rapid and affordable access to interdisciplinary collaborative consultation. *Pain Med* 2015;16:1045–56.
- [56] Turner JA, Anderson ML, Balderson BH, Cook AJ, Sherman KJ, Cherkin DC. Mindfulness-based stress reduction and cognitive-behavioral therapy for chronic low back pain: similar effects on mindfulness, catastrophizing, self-efficacy, and acceptance in a randomized controlled trial. *PAIN* 2016;157:2434–44.
- [57] van Hecke O, Torrance N, Smith BH. Chronic pain epidemiology and its clinical relevance. *Br J Anaesth* 2013;111:13–8.
- [58] Wagner EH, Glasgow RE, Davis C, Bonomi AE, Provost L, McCulloch D, Carver P, Sixta C. Quality improvement in chronic illness care: a collaborative approach. *Jt Comm J Qual Improv* 2001;27:63–80.
- [59] Wallace AS, Seligman HK, Davis TC, Schillinger D, Arnold CL, Bryant-Shilliday B, Freburger JK, DeWalt DA. Literacy-appropriate educational materials and brief counseling improve diabetes self-management. *Patient Educ Couns* 2009;75:328–33.
- [60] White R, Hayes C, White S, Hodson FJ. Using social media to challenge unwarranted clinical variation in the treatment of chronic noncancer pain: the “Brainman” story. *J Pain Res* 2016;9:701–9.
- [61] Williams K. Building capacity in pain medicine: the novel use of group Assessment methods to enhance patient Access to care. *Pain Med* 2016;17:209–10.