

Preclinic Group Education Sessions Reduce Waiting Times and Costs at Public Pain Medicine Units

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Abstract

Objective. To assess the effects of preclinic group education sessions and system redesign on tertiary pain medicine units and patient outcomes.

Design. Prospective cohort study.

Setting. Two public hospital multidisciplinary pain medicine units.

Patients. People with persistent pain.

Interventions. A system redesign from a “traditional” model (initial individual medical appointments) to a model that delivers group education sessions prior to individual appointments. Based on Patient Triage Questionnaires patients were scheduled to attend Self-Training Educative Pain Sessions

(STEPS), a two day eight hour group education program, followed by optional patient-initiated clinic appointments.

Outcome Measures. Number of patients completing STEPS who subsequently requested individual outpatient clinic appointment(s); wait-times; unit cost per new patient referred; recurrent health care utilization; patient satisfaction; Global Perceived Impression of Change (GPIC); and utilized pain management strategies.

Results. Following STEPS 48% of attendees requested individual outpatient appointments. Wait times reduced from 105.6 to 16.1 weeks at one pain unit and 37.3 to 15.2 weeks at the second. Unit cost per new patient appointed reduced from \$1,805 Australian Dollars (AUD) to AUD\$541 (for STEPS). At 3 months, patients scored their satisfaction with “the treatment received for their pain” more positively than at baseline (change score = 0.88; $P = 0.0003$), GPIC improved (change score = 0.46; $P < 0.0001$) and mean number of active strategies utilized increased by 4.12 per patient ($P = 0.0004$).

Conclusions. The introduction of STEPS was associated with reduced wait-times and costs at public pain medicine units and increased both the use of active pain management strategies and patient satisfaction.

Key Words. Health Care Delivery; Patient Education; Self-Management; Interprofessional Practice; Treatment Outcome; Satisfaction; Multidisciplinary Pain Centers; Pain Medicine; System Redesign; Strategic Planning

Introduction

Living with persistent pain is a challenge to patients and their care-providers, with consequent significant demands on both society and health systems. In Australia, the point prevalence of chronic pain is estimated to be 3.2 million people; this number is projected to increase to 5 million by 2050 [1]. The total yearly cost to Australian society is in excess of AUD\$34 billion [1]. Importantly, patients with persistent pain who wait longer than 6 months from referral to access treatment have been shown to deteriorate in terms of health-related quality of life and psychological status [2].

A number of challenges to be met when considering the organization of services to patients with persistent pain (termed chronic if it persists for 3 months in a 6-month period) have been identified by Dobkin and Boothroyd [3]. Importantly, access to care is often limited so that patients are faced with long waiting lists. These authors also highlighted that services offered to patients are frequently fragmented and lacking in the principles of multidisciplinary care [3], often due to the lack of accessible services of psychologists and other allied health professionals.

The Australian Pain Society's *Waiting in Pain* interim report (March 2010) estimated the average wait time for attendance at publicly funded multidisciplinary pain clinics for those with chronic, noncancer pain was 6 months (range 1 to 18 months) in 2009 [4]. More than a quarter of patients referred to chronic pain management services annually would remain on waiting lists for more than one year. Wait times at private pain clinics were found to be shorter, with a mean wait time of 50.7 days, but these services were less likely to be classified as International Association for the Study of Pain (IASP) Level 1 services (i.e., multidisciplinary pain management centre with several disciplines, education and research).

Long waiting lists may at least in part reflect the complexity of persistent pain that is not easily addressed by a purely biomedical approach. The Australian Pain Society has acknowledged these important issues in its recent position statement on Interventional Pain Management Procedures [4].

Blyth and colleagues [5] highlighted the huge social cost of persistent pain in terms of lost workforce capacity. Early access to evidence-based inter-professional care may help to return people with pain to the workforce, thereby reducing this economic burden [6].

The current evidence suggests that provision of knowledge and skills in an adult-learning environment, targeting reductions in anxiety and fear of movement [7–9], behavioral modification [10–12], and activity pacing [13–15] decreases pain and improves function in adults with chronic musculoskeletal pain [16,17]. Kerr et al. suggested that future interventional research should explore the impacts of behavioral and self-management interventions [18].

Promotion of self-management strategies in persons with persistent pain may be linked to increased self-efficacy and improved internal locus of control, which in turn has been shown to reduce requests for recurrent health care [5,19,20]. Interprofessional care, whereby two or more health professionals learn from and about each other's role to improve collaboration and the quality of care [21], is also associated with a reduction in patient health care utilization and improved function [22,23].

Evidence for positive long-term outcomes of psychosocial interventions is emerging. At least one meta-analysis has found positive long-term effects of multidisciplinary treat-

ment on return to work [24]. Independent studies have also demonstrated long-term benefits on pain and functional factors from multidisciplinary treatment [25,26] and education programs [27–30] in a variety of chronically painful conditions.

Unfortunately, access to multidisciplinary pain services is limited in the prevailing Australian health care system [31]. In 2006, Western Australian wait times for newly referred patients to the three tertiary public hospital multidisciplinary pain medicine units ranged from 12 to 24 months. Reasons include lack of funding for multidisciplinary treatment in the current health budget, as well as a shortage of appropriately trained personnel in a climate of health workforce shortages locally and worldwide.

Low to medium duration (e.g., 2 to 8 hours) group programs at most pain services have not been available, nor has access to group programs been provided *before* individual consultations have taken place.

A unique opportunity to undertake translational research in the delivery of services arose when the Western Australian State Health Research Advisory Council (SHRAC) called for research projects to translate evidence into clinical practice along with reduced unit cost to the Department of Health (DoH). Pilot funding (AUD \$200,000) was obtained for a 9-month period to employ additional personnel and purchase research equipment.

The hypothesis for the SHRAC translational research grant was: A system change from a traditional medical consultation model to a new system that encompassed preclinic interprofessional group education, coupled with patient initiated requests for ongoing pain medicine unit services, would lead to: (i) a reduced demand for individual new case outpatient appointments; (ii) reduced clinic waiting times; (iii) increased efficiency of clinic utilization with reduced unit costs; and (iv) improved patient outcomes and satisfaction. This system change was initiated in an environment of outpatient waiting list reform within Western Australia's public health care system.

Methods

Approval was granted by the South Metropolitan Area Health Service Human Research Ethics Committee for this prospective cohort study to assess the impact of introducing a 2-day preclinic group adult learning program called Self-Training Educative Pain Sessions (STEPS). Written informed consent was sought from all participants to use their demographic and outcome data. De-identified data are presented for consenting participants.

Approval was obtained from the Western Australian DoH to analyze data for three tertiary public pain medicine units using The Open Patient Administration System (TOPAS), which is a state-wide computerized database that records all occasions of service for inpatient care and most outpatient care provided by the public health care system. Each person referred to a public health service has a

Unique Medical Record Number used across all services and recorded using the TOPAS database.

A spreadsheet was established and updated weekly in order to track patients invited to STEPS, as well as their attendance and completion of follow-up questionnaires. A separate database collated de-identified patient data from the Patient Triage Questionnaire and all outcome data collected via mailed surveys at 3, 6, and 12 months post-program (supplemented by a telephone survey at 3 to 6 months for nonresponders).

Participants

Patients referred to two public hospital multi-disciplinary pain medicine units participated in this prospective cohort study. Those with persistent pain (duration longer than 3 months) were offered preclinic entry if they met the criteria (see further discussion). A physician, clinical psychologist and physical therapist triaged the patients based solely on written referrals and patient questionnaires.

Patients waiting were invited to participate if they had voluntarily completed a triage questionnaire. Inclusion criteria were: (i) to have an English language capacity sufficient to understand the written and spoken materials being presented; (ii) to be able to give voluntary, informed consent for the ongoing collection of audit data; and (iii) the patient referral was triaged as nonurgent.

Exclusion criteria were: (i) probable dominant diabetic neuropathy, postherpetic neuralgia, or trigeminal neuralgia; (ii) prescribed opioids greater than 100 mg oral morphine equivalents per day; (iii) concerns about the patient's suitability for a group-based education and skills program (based on known medical history and patient questionnaire); and (iv) incarcerated patients. Those excluded from the preclinic program had individual assessments and were then offered attendance at postclinic STEPS if the health professional(s) so recommended. Those with diagnosed major mental disorders were only excluded if their condition was considered to be unstable and possibly disruptive to a group program. They were triaged to a clinic assessment by the STEPS team members.

STEPS

STEPS comprised a six-session program run over 2 days led by clinical psychologists, an occupational therapist, a physical therapist, and pain medicine physicians to impart their knowledge and to share skills with attendees. All modules used interactive small group learning involving up to 12 participants (participants could also invite significant others). There was no minimum group size. Session delivery and patient uptake were enhanced by the use of audiovisual aids and worksheets, as outlined below.

Completion of validated questionnaires (30 minutes) occurred immediately prior to the commencement of the first sessions of the STEPS.

Preclinic Education Reduces Wait-Lists and Costs

Session 1 (60 Minutes) Orientation

This session, led by a clinical psychologist, orients patients toward the importance of pain-related self-management and provides a coherent description of the course components to follow. It provides fundamental messages emphasizing: "whole person engagement;" "the additive benefits of a multi-modal (interprofessional) approach, i.e., using three evidence based strategies is going to work better than using a single evidence based strategy;" "ongoing pain does not equate to tissue damage;" "stress response systems;" and "Pain can't be seen on x-rays." The aim is to expose common misconceptions that could be barriers to patients' therapeutic engagement.

Session 2 (60 Minutes) Pacing

This session, led by an occupational therapist, provides instruction on how to perform routine daily activities in a time-contingent rather than pain-contingent manner and thereby improve function in a sustainable way. A structure is provided for the forward planning of activities and advice on how to structure a daily activity program (e.g., daily walking). Pacing activity sheets are distributed.

Session 3 (45 Minutes) Patient Stories

This component, led by a clinical psychologist, provides patients with an opportunity to reflect upon their own pain experience in the light of the material presented on the first morning. Participants were encouraged to ask questions about personal issues that may have arisen and to share their experiences in coping with persistent pain. This narrative approach was aimed at moving patients' focus toward leading a meaningful life beyond the restrictions of illness [32] in a dialogue in which neither party was dominant [33]. The aim of the session is to assist patients to have the best possible level of personal engagement with the course material and to increase their likelihood of deploying the techniques after completing the course.

Session 4 (75 Minutes) Moving with Pain

This module, led by a physical therapist, introduces basic neurophysiological education as it relates to pain, muscular function and sensorimotor retraining. It provides instruction on appropriate physical activities that may assist patients to reach their goals. The session reinforces pacing principles in an applied context. Exercise and stretching record sheets as well as notes are provided.

Session 5 (90 Minutes) Response to Pain

This module is run on the second day and reviews the previous content. It is led by a clinical psychologist and highlights the potential inputs to the pain experience, which might be favorably influenced by changes in patient understanding, behavior and response. Information is provided on ways to improve mood and coping capacity. The second half of the session focuses on reducing

Davies et al.

avoidance, fear expectancy and the threat salience of pain. It provides tuition in the "Pain Approach," which is learning to use relaxation "in the moment" coupled with acceptance, rather than avoidance of pain throughout daily activities. Mindfulness skills and threat exposure combined with relaxation in the moment ["real-time"] are utilized to change the learning history associated with participants' experience of pain. A sound recording of the relaxation content on compact disc (CD) is given to each participant to take home.

Session 6 (120 Minutes) Medical Options—"Sense-making for people in pain"

This session is led by a pain medicine physician and includes additional neurophysiology education, discussion about the differing viewpoints of health professionals and their patients, and concepts of measuring the expected outcomes of pharmacological and invasive interventions (using evidence-based Number Needed to Treat and Number Needed to Harm). Written information about relevant medications is provided. Discussion to make sense of the persistent pain experience and its management in a context of limited efficacy of medical treatment is discussed.

The sessions are conducted in the same sequence each week, with the content and overall theme of active patient involvement in treatment being linked across sessions. Because the program operates as a series of distinct sessions patients are able to spread their attendance across several weeks, if so desired. While each session is structured, open interaction is encouraged. A combination of teaching aids are utilized, including computer-based presentations, audiovisual clips, whiteboards, worksheets (pacing sheet, stretches, medications), CD recordings, community health professionals contact lists, and hand-outs of copies of slide presentations. Information letters are also provided for each patient's referring doctor. STEPS attendees are encouraged to practice the taught skills prior to individual clinic appointments.

Patient-Initiated Review

Upon completion of the program, patients were encouraged to phone and ask to attend individual tertiary pain medicine unit consultations for further advice or for services not easily available in the community such as inter-professional individual consultations, prescription of pregabalin or gabapentin (not available at reduced prices through the Federal Pharmaceutical Benefits Scheme), selected interventional procedures, and our 80-hour multidisciplinary pain management program. Improving the patient's network with existing community-based health professionals was encouraged and aided by providing community-based physical therapy contact lists during STEPS and at pain clinic appointments.

Preceding Administrative Process

Both Pain Medicine Units, prior to the commencement of the STEPS program, posted a form letter to the address of

all existing referrals for patients not yet seen in the Unit; patients were asked to tick a box indicating whether or not they still wanted an appointment. If no response was received, the referrer was contacted to confirm or update the patient's contact details. A second letter was then sent to the patient. If again there was no response, the patient and referrer were notified that the referral was void but, if required, could be reinstated by phone or postal contact. Following implementation of the new triage protocol, all existing and new referrals were eligible to attend STEPS.

Measures

The primary outcomes of this study were systems-based outcomes (1 to 7); the secondary outcomes for this article were selected patient outcomes (8 to 10).

Primary System Outcomes Measures

- Engagement or non-engagement was determined by the number of patients booked who subsequently attended the STEPS group program, either preclinic (following paper triage) or postclinic (following an individual consultation at the pain service) appointments.
- Implementation of consumer choices was assessed by the number of patients who attended STEPS and chose to self-manage and/or link with community services compared with those who attended STEPS and then requested individual clinic appointments.
- Wait-time in weeks calculated using the TOPAS hospital electronic patient appointment record system as described above. Wait-time was calculated as the time from first referral (as entered into TOPAS) to the first appointment offered at the pain service (group or individual). For this study, patients who did not attend an offered appointment were included.
- Occasions of service were also determined from the TOPAS record system and defined as the number of appointments made for all patients including those who did not attend. This provides a metric of the overall volume of patient contacts in the pain medicine unit. This is provided for the one site that provided STEPS program to both sites.
- Unit cost per new patient was calculated by summing the total salary costs of the pain medicine unit and dividing this by the number of new patients offered an appointment. The cost of office and clinic space, capital expenses, and goods and services are not included. This is provided for site one that provided the STEPS program to both sites.
- New to follow-up ratio was determined by counting the number of Unique Medical Record Numbers recorded as either new or follow-up in the TOPAS record system during the period of the study. The ratio is derived by dividing the number of follow-up appointments by the number of new appointments. This ratio provides a metric for a pain unit's ability to appoint new patients compared with follow-up patients who book recurrent appointments at the tertiary pain medicine units. This is provided for site one that provided the STEPS program to both sites.

- Patient disposition and adverse events were recorded separately in the pain medicine unit spreadsheet in terms of patients who did not attend group appointments, cancellations and re-appointment to individual appointments (without completing attendance at the group sessions).
- Referral rate was a measure of new referrals to the pain service per annum as an indication of acceptability of the system change to referrers. The TOPAS record system data was analyzed to identify exchange of referred patients to alternate sites.

These primary system outcomes measures are summarized in Table 1.

Secondary Patient Outcome Measures

- Health outcomes were measured using the following tools: Pain Disability Questionnaire [34]; Pain Self-Efficacy Questionnaire [35]; Medical Outcomes Study Short Form 36 [SF36] [36]; the Hospital Anxiety and Depression Scale [37], and the Brief Pain Inventory [38], in accordance with the IMMPACT recommendations [39]. Early preliminary data is summarized for these measures at baseline and 3 months. Future articles will report on a wider data pool with a follow-up period of 12 months. In addition to these measures the variables described below are reported.
- Patient satisfaction was monitored using responses on the preclinic triage questionnaires compared with 3-month postal surveys. Patients were asked to indicate using a 7-point Likert item (-3 = not satisfied, 0 = partially satisfied, +3 = completely satisfied) their answers to the following questions:
 1. How satisfied were you with the treatment you have received for your pain?
 2. How satisfied are you with the treatment you have received for your pain *prior* to coming to the Pain Medicine Unit?
 3. How satisfied are you with the treatment you have received at the Pain Medicine Unit (*so far*)?
- The Global Perceived Impression of Change (GPIC) scale asks patients to indicate using a 5-point Likert item containing five descriptive points (-2 = very much improved, -1 = much improved, 0 = no change, +1 = much worse, +2 = very much worse) to respond to the question: "What is your overall perception of your pain since you have been seeking pain advice?"
- Pain management strategies were measured by expanding the coding previously used by Blyth and colleagues [5]. Patients indicated which strategies they were currently using (see Figure 1). Active treatments are those which involve the patient taking responsibility for carrying out the treatment. Passive treatments are those carried out by others (including health care professionals) [40]. These were categorized as Active-Behavioral, Active-Cognitive, both summed as "Active strategies," and Passive and Passive-Conventional Medical, both summed as "Passive strategies." The breadth of these strategies includes many available strategies as well as specific skills taught in the STEPS

Preclinic Education Reduces Wait-Lists and Costs

program. These strategies were counted separately for each of the four categories. For each strategy patients were asked to indicate if the strategy was "used" or "commonly used." If both were checked it was counted as one response. Responses were classified as "missing" only if all responses were left blank.

- Telephone follow-up was undertaken for patients not returning the postal surveys. They were contacted between 4 and 6 months post-STEPS and asked about their progress and then to answer the following questions: (i) "How satisfied were you with the treatment you received for your pain so far?" using a 5-point Likert item (1 = not at all satisfied, 2 = somewhat satisfied, 3 = average satisfaction, 4 = more than average satisfaction, 5 = excellent satisfaction); (ii) "How is your overall perception of your ability to cope with the pain since attending STEPS?" using a 5-point item (-2 = very much improved, -1 = much improved, 0 = no change, +1 = much worse, +2 = very much worse); (iii) what strategies they were utilizing; (iv) whether they had been in contact with their GP, physical therapist or other health professional regarding their pain management; and finally (v) whether or not they were happy to initiate appointments with the pain service if necessary.

Data Analysis

Demographic variables are described using means and standard deviations (SDs) for continuous variables, and frequencies and percentages for categorical variables. The change in GPIC, unit cost, health care utilization and patients' satisfaction were analyzed using paired *t*-tests. The analysis included data collected pretreatment and from postal surveys at 3 months. The responses for patient satisfaction and GPIC were treated as continuous as well as categorical variables (i.e., satisfied/not satisfied, improved, same, and deteriorated).

Results

Program Statistics

All primary outcomes measures for system outcomes were obtained from TOPAS and include all patients booked to attend STEPS. Thirty-one STEPS programs were delivered over the initial 9 month period (October 2, 2007 to June 30, 2008). At the first pain unit, the waitlist was cleared of patients judged suitable to attend STEPS by April 2008. Patients on the second pain unit waitlist were then triaged and booked to attend STEPS if they met the inclusion criteria.

Three hundred and nineteen patients were triaged to attend STEPS during the study period. Of these, 291 patients were triaged directly (preclinic) to STEPS, whereas the remaining 28 were scheduled following an individual clinic assessment (postclinic). Routine baseline data were collected on 299 patients of whom 204 attended (20 patients declined or were unable to complete

Table 1 Primary system outcomes measures: pre- and post-implementation of Self-Training Educative Pain Sessions (STEPS)

Variable	Measure tool/strategy	Scale	Results	
			Pre- STEPS	Post- STEPS
Engagement or non-engagement*	TOPAS electronic hospital record	Frequency count (%)		
Preclinic STEPS engagement			Not Applicable	60
Postclinic STEPS engagement			Not Applicable	100
Implementation of consumer choices†	TOPAS electronic hospital record	Frequency count (%)		
Follow-up in community			Unknown	52
Follow-up in pain medicine unit			Unknown	48
Wait time in weeks‡	TOPAS electronic hospital record	Weeks		
Site one			105.6	16.1
Site two			37.3	15.2
Occasions of service§	TOPAS electronic hospital record (OOS)	Frequency count (n)		
Total			329	2,346
New to follow-up ratio¶	TOPAS electronic hospital record (based on UMRN)	Frequency count (n)		
New patients			121	582
Follow-up patients			119	245
New to follow-up ratio			1 to 0.98	1 to 0.37
Unit cost**	TOPAS electronic hospital record	AUD\$		
Yearly total			218,648	513,101
Per patient			1,805	881
Patient disposition and adverse events††	TOPAS electronic hospital record and tracking database	Frequency count (%)		
Did not attend preclinic STEPS				40
Triaged to preclinic STEPS however cancelled or requested individual consultations				7
Inappropriately triaged to preclinic STEPS				1
Referral rate‡‡		Frequency count (n)		
Pain medicine unit referrals: site one	Internal record of referrals		~300	~750
Net flux away from STEPS processes	TOPAS electronic hospital record		Unknown	2

* Number of patients who attended STEPS (two sites).

† Number of patients who chose follow-up in community vs pain medicine unit (two sites).

‡ Time from the first referral to the first appointment (two sites).

§ Number of appointments made for all patients in the pain medicine unit (site one).

¶ New and follow-up ratio based on Unique Medical Record Numbers (UMRN) (site one).

** Unit costs total salary divided by the number of unique new patients appointed per annum (site one).

†† Number of patients who did not attend STEPS, or who were inappropriately triaged to STEPS (two sites).

‡‡ Number of patients referred to the pain medicine unit (site one).

TOPAS = The Open Patient Administration System.

5. What do you find helps to relieve your pain? - Please tick the (1st checkbox) of the strategies that you use and put a tick in the (2nd check-box) of the five that you would most commonly use.

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ACTIVE Strategies		COGNITIVE Strategies		PASSIVE Strategies		CONVENTIONAL MEDICAL Strategies	
USE	COMMONLY USE	USE	COMMONLY USE	USE	COMMONLY USE	USE	COMMONLY USE
Exercise	<input type="checkbox"/>	Relaxation	<input type="checkbox"/>	Changed diet	<input type="checkbox"/>	Took medication/s	<input type="checkbox"/>
Daily walking	<input type="checkbox"/>	Distraction	<input type="checkbox"/>	Avoided activity	<input type="checkbox"/>	Used brace/s	<input type="checkbox"/>
Corrected posture and / or did stretches	<input type="checkbox"/>	Prayer	<input type="checkbox"/>	Rest	<input type="checkbox"/>	Used TENS machine	<input type="checkbox"/>
Worked	<input type="checkbox"/>	Meditation	<input type="checkbox"/>	Hot bath / shower	<input type="checkbox"/>	Physiotherapy treatment (e.g. Manipulation)	<input type="checkbox"/>
Did usual tasks	<input type="checkbox"/>	Reduced stress	<input type="checkbox"/>	Hot or cold packs	<input type="checkbox"/>	Chiropractor	<input type="checkbox"/>
Modified activities	<input type="checkbox"/>	Ignored pain	<input type="checkbox"/>	Massage	<input type="checkbox"/>	Acupuncture	<input type="checkbox"/>
Did small 'bits' often	<input type="checkbox"/>			Smoked	<input type="checkbox"/>	Procedures (e.g. Needles)	<input type="checkbox"/>
Physiotherapy (core muscle exercises with Real-Time Ultrasound)	<input type="checkbox"/>			Drink alcohol	<input type="checkbox"/>	Surgery / Operations	<input type="checkbox"/>
The middle road (e.g. Didn't under / over do things)	<input type="checkbox"/>						

Figure 1 Pain management strategies (Version 1: October 2007–October 2009).

questionnaires). Consent for the use of de-identified questionnaire data was obtained from 156 participants of the 204 patients attending STEPS.

Demographics

Questionnaire data are available for 143 consenting patients (13 data sets were incomplete). The age range was from 21 to 92 years (mean 55.6, SD 14.6). Forty-six percent of attendees were male and 54% were females; 52% were Australian born; 54% had a "stable partner or significant other;" 24% were "employed" (either volunteer or paid work); 83% held "health care cards," which indicates a low reported annual income (current upper thresholds are reported annual income less than AUD \$30,000 for a single adult and less than AUD \$50,000 per couple); 3% were covered by workers' compensation or motor vehicle accident insurance, and 6% were currently seeing (or planning to see) a solicitor about their injury or pain. The average duration of pain was 9.2 years (SD 12.3) with a range of 0.4 to 51 years.

Primary System Outcomes

Engagement or Nonengagement

Preclinic STEPS engagement rate was 60% (176 of 291 patients attended) and the non-engagement rate was 40% (115 of 291 did not attend). Ninety percent of patients who did not engage in preclinic STEPS organized individual clinic consultations. The Post-Clinic STEPS engagement rate was 100%; as all 28 patients scheduled to attend STEPS following individual assessments attended.

Implementation of Consumer Choices

Ninety-one of 176 patients (52%) patients who attended preclinic STEPS subsequently chose to utilize self-care or co-care, via community health professionals. These 91 patients judged that they did not need further individual consultations at either tertiary pain service during the following 12–21 months. Eighty-five patients (48%)

Davies et al.

initiated tertiary one-to-one consultations following pre-clinic STEPS attendance.

Wait-Time

New referrals to the first pain medicine unit had an average wait-time of 105.6 weeks (2.03 years) in the 3-month period immediately prior to commencing the STEPS program (July 1 to October 1, 2007). This wait-time was reduced to 16.1 weeks (3.7 months) for those attending STEPS and 19.2 weeks (4.4 months) for patients attending any service at the pain medicine unit (STEPS or non-STEPS) in the last 3 months of the trial (April 1, 2008 to June 30, 2008). The first pain medicine unit (site one) provided the STEPS program for the second pain site (May 2008 to May 2009).

New referrals to the second pain medicine unit had an average wait-time of 37.3 weeks (9.3 months) in the 3-month period immediately prior to commencing the STEPS program (February 1, 2008 to May 1, 2008). This wait-time was reduced to 15.2 weeks (3.8 months) for any service at the second pain unit (STEPS or non-STEPS) 9 months after commencing the program (December 2008 to 30th December 2008).

Occasions of Service

At the first pain medicine unit there were 329 booked occasions of service in the 12 months from January 1, 2006, which comprised 121 new and 119 follow-up patients (total of 240 individual patients). This increased to 2,346 booked occasions of service in the 12 months from October 1, 2007, which comprised 582 new and 215 follow-up patients (total of 797 individual patients). Attendance at the STEPS program in this time period was recorded as four occasions of service to enable booking for the separate sessions (this has since been modified in order to capture attendances at all six sessions). Appointments for the individually requested 4-week multidisciplinary pain management program and interventional procedures were not included in these calculations.

Unit Cost

Staffing costs (salaries) for the first pain medicine unit were AUD\$ 218,468 per annum (from January 1, 2006) to provide a service to 121 new patients resulting in a unit cost per new patient booked of AUD\$1,805. This is compared with AUD\$ 513,101 per annum (from October 1, 2007) to provide the pre-existing service and the new STEPS service to both pain medicine units for a total of 582 new patients resulting in a unit cost per new patient booked of AUD\$ 881 (including STEPS and non-STEPS); or AUD\$ 541 per new patient booked for STEPS, which includes the cost of optional patient-initiated pain team individual follow-up appointments.

New to Follow-Up Ratio

In the calendar year following January 1, 2006 there were 121 new patients and 119 follow-up patients were given

appointments at the first pain medicine unit (ratio 1:0.98). Between October 1, 2007 and October 1, 2008, there were 582 new patients and 215 follow-up patients (ratio: 1:0.37).

Patient Disposition and Adverse Events

Ninety patients did not engage with preclinic STEPS (did not attend). In addition 25 patients were inappropriately triaged. These comprised 21 patients who requested individual assessments or cancelled their referral, and a further four patients who were considered inappropriately triaged upon arrival at STEPS because of language difficulties, limited mobility or inability to participate in groups.

Subsequently 90% (N = 81) of the patients who did not attend STEPS and 44% (N = 11) of those inappropriately triaged (see earlier discussion) attended individual consultations during the following 12 to 21 months.

Referral Rate

In 2007 approximately 300 new patients were referred to the first pain unit per annum; a number that has increased to more than 1,000 in 2009. During the 9-month study period there was a net movement of two patients away from the two pain units accessing STEPS to a third metropolitan pain unit not accessing STEPS

These primary system outcomes results are summarized in Table 1.

Secondary Patient Outcomes

Data were available for 156 patients at baseline and 61 returned posted surveys at the 3-month follow-up. A telephone survey was completed for a further 47 patients who had not returned questionnaires at 3 or 6 months (total of 108 data sets).

Health Outcomes

There were no significant changes in anxiety or depression, as measured by the Hospital Anxiety and Depression Scale; in mental health as measured by the Mental Composite Score (MCA) of the SF 36; or pain as measured with the VAS pain scores from the Brief Pain Inventory. However, preliminary analysis of health outcomes showed significant ($P < 0.05$) changes in the Physical Composite Score of the SF 36; the Pain Self-Efficacy scale; and the Functional and Psychological scores, as measured by the Pain Disability Questionnaire. The health outcome data will be analyzed and presented in more detail in a future article.

Patient Satisfaction

Patient satisfaction includes data from both the postal and phone surveys and is reported here by item:

- *How satisfied were you with the treatment you have received for your pain?* Satisfaction scores showed a

statistically significant improvement on the 7-point Likert item from a mean -0.79 (not satisfied) (SD 1.61) at baseline to 0.09 (satisfied) (SD 2.11) 3 months later (change score = 0.88 SD 1.76; paired t -test $P = 0.0003$). Of the 29 patients initially not satisfied, 13 (44%) were satisfied at the 3-month survey, while only three patients (10% of those initially satisfied) were no longer satisfied at 3 months.

- *How satisfied are you with the treatment you have received for your pain prior to coming to the Pain Medicine Unit?* There was no significant difference in change scores from baseline to 3 months (paired t -test; $P = 0.5486$).
- *How satisfied are you with the treatment you have received at the Pain Medicine Unit (so far)?* Seventy-three percent of patients were partially satisfied (or better) at 3 months. Change values were not calculated due to the high number of missing values from patients who responded on the preclinic triage questionnaire: "I haven't been seen yet."

GPIC

Scores on this measure showed a statistically significant improvement of -0.46 (SD 0.83; $P < 0.0001$) on the 5-point Likert item from a mean of 0.20 (slightly worse) (SD 0.67) at baseline to -0.14 (some improvement) (SD 0.86) 3 months later. Of the 61 patients with returned postal surveys, 27 remained the same, 28 improved, and 6 reported being worse.

Pain Management Strategies

There was a significant positive change from baseline to 3 months in the use of active-behavioral, active-cognitive, and passive strategies whereas conventional strategies (e.g., medications, procedures) did not change. The number of active-behavioral self-management strategies used increased from a mean of 2.9 (SD 3.0) at baseline to 5.5 (SD 3.3) with the mean change of 2.5 (SD 3.4; $P < 0.0001$). Active-cognitive self-management strategies rose from a mean of 1.7 (SD 1.6) at baseline to a mean of 3.2 (SD 2.8); with a mean increase in strategies of 1.4 (SD 2.6; $P = 0.0004$). Passive strategies rose from a mean of 3.1 (SD 2.5) at baseline to 4.0 (SD 2.9) at 3 months with a mean change of 1.2 (SD 2.5 $P = 0.0014$). Statistical significance was not demonstrated on the use of passive-conventional medical strategies (baseline mean = 3.1 , SD 2.5 and 3 month mean = 2.3 , SD 1.9; $P = 0.6102$).

Telephone Follow-Up

Of 47 patients contacted: (i) 74.4% were partially satisfied (or better); (ii) 74.5% were using at least one of the active self-management strategies from the STEPS program; (iii) 45% reported an increase in their ability to cope with their pain (mean = -0.51 , SD 0.86) following STEPS; and (iv) 89.1% were happy to have patient-initiated re-contact the pain medicine unit if needed. Shared care with community-based health professionals was reflected by 89.4% of patients who had re-discussed options with their

Preclinic Education Reduces Wait-Lists and Costs

general practitioner, and 45% of those with back pain who had seen a community physical therapist.

Discussion

The implemented system changes to the pain service enabled us to deliver preclinic expert-led inter-professional group education and to focus on patient self-management approaches. It was found that preclinic group education for patients with persistent pain attending our Pain Medicine Unit reduced the overall unit cost per new patient and decreased the new to follow-up ratio of attendances, reflecting the increased number of new patients appointed and reduced need for follow-up appointments. This resulted in significantly reduced waiting times for new patients to access the pain units while increasing the total number of individual patients seen. The non-engagement rate for preclinic STEPS of 40% was higher than the traditional non-attendance rate for our patient individual clinic appointments (30%).

Viewing occasions of service together with the new to follow-up ratio (based on unique medical record numbers) provides an indication that significant efficiency was achieved along with the increase in the units' overall throughput. Our lowering of the new to follow-up ratio demonstrates that more new patients are appointed in comparison with follow-up patients. It is suggested that these variables taken together provide a useful means of assessing a system's ability to achieve efficient service delivery.

We suggest that the benefits of the preclinic group program are twofold. First, that the health care professionals can interact meaningfully with up to 8–12 new patients in each 1–2 hours of STEPS session, thereby increasing the number of new patients seen by a service (where the resources are constrained); second, reduction in recurrent clinic attendances (reduced follow-up patients) follows from patient group education in active pain management strategies has both patient and system benefits. Prior to STEPS we used a system whereby patients first attended the clinic and were then offered two educational sessions. This may have had some impact on return visits and hence wait-times but not to the same extent as the pre-clinic education as it did not provide the first benefit.

Shorter waiting times provide timely access to the pain medicine units. It has also been demonstrated that following STEPS many patients increased their use of active pain management strategies. In this way, the requirement for scheduling individual outpatient appointments was reduced suggesting that some patients were better able to independently manage their pain. The reduction in waiting times for individual outpatient clinic appointments provides greater flexibility in responding to patient needs across the multiple services offered by the pain units.

Flexibility was enhanced by patients being able to schedule attendance at STEPS according to their individual time-based availability and travel requirements. The group

structure of STEPS meant that non-attendees do not impair its efficiency as the time committed is spent with those attending, and non-attendees can be accommodated at a future date. This is in contrast to missed individual appointments that become nonpatient contact time for health professionals. Attendance flexibility did not appear to impair group identity and cohesiveness.

Early follow-up of patients after the completion of STEPS demonstrated that they were satisfied with the management options they received and were receptive and responsive to the patient-initiated style of service provision. Improvements in patient satisfaction were only statistically significant in patients who attended STEPS at the pain medicine units; and not for treatment received *prior* to attending the units. Patients reported increased use of active pain management strategies as well as an improvement in global rating of the impact of pain on their lives.

It needs to be emphasized that STEPS is specifically aimed at improving patients' functional abilities in their daily lives rather than specifically addressing mental health issues that, when relevant, are addressed by other parts of our service. This aim is reflected in the improvements in Physical Composite Score of the Medical Health Outcomes and the Functional Component of the Pain Disability Questionnaire. We did not expect any significant changes in the overall scores for anxiety and depression as measured by the Hospital Anxiety and Depression Score (because the averaged initial scores were within the normal range). More extensive data will be presented and analyzed in our next article.

The open discussions with patients within STEPS provided us with significant insights into their expectations. These included the need for provision of timely access to the service, appropriate care in addressing their health issues, the provision of clear and rational advice [41], and the opportunity to freely communicate with us whenever further explanation and advice was required.

In turn, health care professionals found that patients who had a better understanding of their pain were better equipped to participate in subsequent clinical encounters. This was due to their improved understanding of pain, and its many inputs, and greater insight into the importance of comprehensive management strategies. For these patients, any subsequent management options were more effectively presented, explained, or refined using terms with which the patients were now familiar.

Limitations

This study did not have either a wait-list control group, or a "treatment as usual" group due to lack of funding; however it achieved the main aim, which was to investigate the system efficiency achieved by introducing a pre-clinic education-based STEPS model. The results of this study provide preliminary evidence on which to base proposals for system change. in health care provision.

We believe that the patient sample involved in this project was representative of a typical pain medicine unit in a Western Australian public hospital. Although the mean age of the sample was 56.68 years, the patients ranged in age from 21 to 92 years. This patient cohort contains 83% of people on low income presenting to our services with long term pain (average 9.21 years), many of whom have experienced repeated treatment failure.

A limitation of our study is the number of patients lost to follow-up (31%). At 3-months, 61 of 156 patients had returned completed questionnaires. A subsequent telephone follow-up gathered data on a further 47 patients. It is not known whether patients lost to follow-up utilized any of the knowledge or skills provided by the program. We encourage further exploration of strategies to target patients who are not able to engage with these approaches. Another limitation is the relatively short time period of follow-up, which will be addressed in a subsequent publication reporting on clinical outcomes up to 12 months.

We have not determined if there are differences between the patients who subsequently requested individual appointments following STEPS, and those that did not. The differences will be described in our subsequent article focusing on patients' outcomes.

There are no indications that this program would be more or less useful to different age groups. A sub-group analysis on age groups will be done as part of the ongoing study. Future research needs to be undertaken to investigate the value of introducing similar preclinic group-education programs designed for children and adolescents with persistent pain.

Finally, the patient outcome data should be interpreted with caution, as the overall clinical significance of the modest changes is unclear, as our process has not been compared with "usual care." A randomized controlled trial is required to answer this question.

Implementing System Change

Several factors that either discourage or promote the uptake of self-management strategies have been previously identified. Barriers to self-management models include: access issues (limited resources, time, physical limitations, and lack of support from friends and family); service delivery limitations (ineffectiveness of pain-relief strategies, difficult patient-physician interactions, lack of tailoring strategies to meet personal needs); and patient issues (depression, avoiding activity because of fear of pain exacerbation, not being able to maintain the use of strategies after study completion) [35]. Conversely, facilitators to improve pain self-management include encouragement from nurse care managers, improving depression with treatment, supportive family and friends, and providing a range of different self-management strategies for use [42].

When seeking to replicate a similar system change, we suggest assessing both the drivers and resistors toward such change. Typical resistors to change might include: the pervading culture within the institution; rigidity of leadership due to fear of system change; lack of understanding of the complexity of the prevailing system; bureaucratic constraints; perceived threat to the status of health professionals; vested interests in preserving the *status quo* and unfavorable financial resource allocation. On the other hand, drivers toward system change might include the requirement to benchmark system outcomes, to report patient outcomes, passionate leadership, consumer focus, champions for change, lack of workforce, and increased demand for service.

During the implementation of the STEPS program a need was identified to modify preexisting patient booking systems. Throughout this process, it became apparent that capturing data for this nontraditional clinic approach utilizing current hospital systems was inadequate. It would appear that in deploying a flexible health care delivery mode, new health care information technology systems maybe required.

Implications

The authors believe this approach to the management of pain is safe, effective, and satisfactory to patients. We believe that wider implementation of similar approaches can lead to more efficient specialist services and reduced recurrent utilization of health care resources at the tertiary and community levels. How these approaches might impact on long-term patient outcomes is still not known and requires further investigation.

Self-management and choices by patients to access health care depend on them having adequate knowledge to make informed choices about treatments and using skills to complement their medical treatment. Accordingly, the STEPS project aims to provide patients with knowledge and skills based on a biopsychosocial model. We also ensure that primary care providers are informed of all management options that are discussed with their referred patients. The professionals involved in the STEPS program have extensive experience in the field of pain medicine, and throughout STEPS they freely provide information at any level of understanding, making it easier for patients to relate such information to their own pain experience, thereby facilitating behavioral change and promoting their active self-management [22].

Conclusion

A system change from a traditional medical consultation model to a new system that includes preclinic STEPS was associated with reduced unit cost, reduced demand for individual outpatient appointments and reduced clinic wait-times. Furthermore, the new system increased clinic efficiency by decreasing the ratio of new to follow up appointments, and improved the utilization of active pain

Preclinic Education Reduces Wait-Lists and Costs

management strategies by patients with improved satisfaction with their health care.

In our opinion, the reported increase in the uptake of active pain management strategies suggests that our patients have been empowered to make choices through their acquisition of imparted knowledge and skills. We suggest that one factor in this process is that the programs have been delivered with empathy by health professionals.

Our new system appears to be a cheaper alternative to a clinician-centered model and highly flexible and responsive in allowing timely access to specialist services. In the current restrained financial climate and with projected workforce shortages and an aging population, all health care systems must improve cost efficiencies to be sustainable.

This study has three important implications for pain medicine. First, it shows that many patients are satisfied with and engage with patient-centered self-management approaches. Second, it was demonstrated that these approaches can be cost and time efficient. Third, the results suggest that teaching active self-management approaches as an essential component of first-line pain management maybe linked to reduced recurrent health care requests. Patient education and implementation should be considered early in pain management rather than being reserved for those patients who have exhausted all passive treatment options.

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Davies et al.

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