Pain Medicine 2016; 17: 278–294
doi: 10.1093/pm/pnv048

OXFORD

PRIMARY CARE & HEALTH SERVICES SECTION

Original Research Article

Assessment of Adults Experiencing Chronic Non-Cancer Pain: A Randomized Trial of Group Versus Individual Format at an Australian Tertiary Pain Service

Natalie Smith, DClinPsych,[*]
Meredith Jordan, MClinPsych,[†]
Ruth White, MScMed (PMgt), BAppSc (Phty),[†]
Jenny Bowman, PhD,[*,‡] and
Chris Hayes, FFPMANZCA, M Med (PMgt)[†]

[*]University of Newcastle, School of Psychology, New South Wales, Australia; [†]Hunter Integrated Pain Service, Hunter New England Local Health District, Newcastle, New South Wales, Australia; [‡]Hunter Medical Research Institute, Newcastle, New South Wales, Australia

Correspondence to: Meredith Jordan, MClinPsych, John Hunter Hospital Campus, Locked Bag 1, Hunter Region Mail Centre, NSW, Australia 2310. Tel: 612-492-23435; Fax: 612-498-55045; E-mail: Meredith.jordan@hnehealth.nsw.gov.au.

Disclosure and conflicts of interest: We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no direct or indirect financial support for this work that could have influenced its outcome.

Abstract

Objective. To compare the outcomes of a new group assessment format with conventional individual assessment.

Design. A randomized controlled trial.

Setting. An Australian tertiary hospital multidisciplinary pain service.

Patients. Adults referred with chronic non-cancer pain.

Methods. Following attendance at an education and orientation group, 211 participants were randomized to either a group assessment format (focused on supported self-assessment) or individual assessment. Follow-up occurred 3 months post-assessment and prior to subsequent pain service intervention. Outcome measures were pain intensity, pain interference, self-efficacy, psychological distress, health care utilization beyond the pain service, waiting time, participant satisfaction, and implementation of self-management strategies.

Results. Seventy-two participants undertook group assessment and 90 were assessed individually. Follow-up data were collected on 57 group and 72 individual assessment participants. Results revealed no significant differences between the two assessment formats in outcome with the exception of wait-times. Median wait-time to the first offer of assessment was 47 days for the group format and 144 days for individual.

Conclusions. Group assessment provides a viable alternative to conventional individual assessment. The group assessment reduced wait-times while delivering otherwise comparable outcomes.

Key Words. Chronic Pain; Multidisciplinary; Wait-Time; Self-Management; Assessment; Group

Introduction

In Australia, people experiencing chronic non-cancer pain report high levels of pain related disability [1] and wait an average of 150 days to access publically funded multidisciplinary pain services [2]. Further deterioration in health related quality of life and psychological wellbeing can occur while waiting to access pain services [3].

Conventional models of care at tertiary pain services begin with a thorough individual multidisciplinary assessment [4]. Clinicians act as agents for the patient by making treatment recommendations at a time when the patient has not yet transitioned to self-management [5]. This delivery format has long been considered the gold standard and a foundation of biopsychosocial

management; however, it is resource intensive [6] and efficacy is difficult to quantify [7].

Internationally, targeted processing interventions have been used to improve patient flow within pain clinics [8]. Similarly, in the Australian setting, new models of pain service delivery have arisen in response to long wait-times and the demand for increased patient throughput. Pre-assessment group interventions have reduced wait-time to initial contact, encouraged patient engagement with self-management strategies, and provided a cost effective and satisfying path of entry to pain services [9,10]. In addition, early exposure to group interventions serves to socialize attendees to that form of service delivery and increase engagement with later more intensive group interventions [11]. Pre-assessment groups are resource efficient and can be used to offer patients the opportunity to take a greater role in managing their own health care, consistent with contemporary chronic disease management [12–14]. In this context clinicians are seen in a support role assisting patients and families to acquire the skills and confidence to actively self-manage their condition [5].

After the successful implementation of a pre-assessment education and orientation group [9], Hunter Integrated Pain Service (HIPS) elected to invest further in the group process and develop a new group format for the assessment phase. The concept of the new group format was based upon supported self-assessment as a prelude to self-management. The new group effectively provided an additional layer of care as part of a stepped approach [12,15].

This study compared the new group assessment format to conventional individual multidisciplinary assessment through a randomized controlled trial. The potential for either assessment format to influence behavior and bring a therapeutic benefit within the stepped approach was recognized. It was hypothesized that the new group format would provide at least comparable clinical outcomes and reduce wait-times.

Methods

Setting and Design

This parallel-group, block randomized controlled trial was conducted by HIPS, a Hunter New England Local Health District tertiary multidisciplinary pain management service based in the public hospital system in Newcastle, New South Wales, Australia. The study was approved by the Hunter New England Human Research Ethics Committee.

Sample Size and Randomization

The required sample size to allow sufficient power (80%) for analyses was estimated to be 64 participants for each assessment format with a medium effect size of 0.5 based upon psychological distress (K10). To allow for participant drop-out and based on clinician observations of attendance rates at HIPS, a sample size of 100 for each format was chosen. Computer software, G-Power 3.1 [16] was used for all sample size calculations and post hoc power calculations. A University of Newcastle statistician with no clinical involvement in the trial performed block randomization using JMP Version 9 statistical software [17] using 1:1 allocation and a fixed block size of 10. Patients were processed in alphabetical order and allocated a participant number at the start of each block. This was the variable used for the block randomization, with the computer sequence generating the number sequence for the experimental groups.

Participant Recruitment

Study participants were recruited from the cohort of adult patients who had attended a pre-assessment

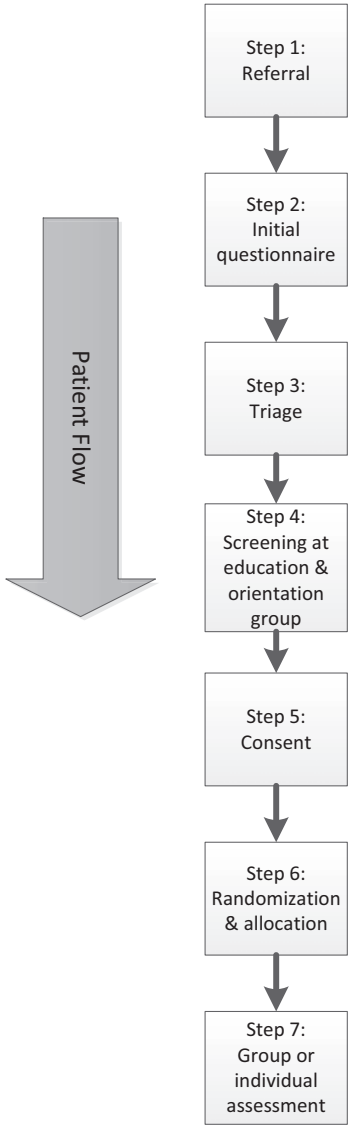

Figure 1 Patient process flow.

education and orientation group at HIPS. The patient process flow to assessment is shown in Figure 1. All patients had been referred to HIPS by their general practitioner (GP) or medical specialist for assessment and management of chronic non-cancer pain (Step 1) and had been mailed, then completed and returned an entry questionnaire (Step 2). From the referral and questionnaire information, patients were triaged and deemed suitable to attend multidisciplinary assessment (Step 3) and invited to attend the education and orientation group (Step 4). Attendance at this group was not offered to patients with cancer or vascular related pain, other documented red flag conditions, or those with age related cognitive dysfunction. The education and orientation group is a 90-minute seminar delivered by a pain medicine specialist and clinical psychologist [18]. The neuroscience of pain [19,20] and its treatment are summarized and the person is oriented to HIPS treatment pathways, including the transition from a biomedical to a broader management focus, and the choice to continue with the tertiary service or return to their GP for coordination of a primary care based approach. At the end of the seminar, the nature of the study was explained, an information sheet provided, and consent obtained (Step 5). After consent, participants were randomized and allocated (Step 6) to attend either group or individual assessment (Step 7). Inclusion criteria for the study were English speaking patients who had chosen to continue with the tertiary service. Patients were excluded if they: 1) were triaged to any other HIPS management options; 2) requested the alternative assessment format to which they were assigned; 3) hospitalized and unable to attend their assessment; 4) no longer experienced pain; or 5) had an intellectual disability that would limit engagement with the group assessment process.

Baseline Data

All adults referred to HIPS complete an entry questionnaire. This provided baseline data that included demographics (age, gender, marital status, compensation status, pain site, height, and weight); work status; current medication; and standardized outcome measures including pain severity and interference (Brief Pain Inventory; BPI) [21–23], pain self-efficacy (Pain Self Efficacy Questionnaire; PSEQ) [24,25], and psychological distress (Kessler 10; K10) [26–28]. The psychometric properties of these instruments are well documented [21–28]. The questionnaire also enquired about health care utilization in the previous 3 months (number of visits to health professionals external to the pain service: GPs, specialists, and other health professionals).

Follow-up Data

Follow-up data were collected at 3 months post assessment and prior to any further pain service intervention. Participants were sent a review questionnaire (including BPI, PSEQ, K10, and health care use in the last 3 months) by mail. This was followed by a phone call 2 weeks later from a postgraduate psychology student or nurse. The follow-up caller was blind to the assessment allocation and had no clinical involvement in the trial. A follow-up telephone script (Table A1) was used for each phone call to ensure standardization and a clinical psychologist (Meredith Jordan) observed at least two phone calls by each caller to ensure fidelity. The follow-up phone call was used to prompt return of the review questionnaire and ascertain participant satisfaction with the assessment undertaken, confidence in strategy implementation, and percentage of chosen management strategies being implemented.

Participant satisfaction was measured by asking, using a 5-point Likert scale (1 = strongly dissatisfied, 2 = dissatisfied, 3 = neither satisfied nor dissatisfied, 4 = satisfied, 5 = extremely satisfied) "How would you rate your satisfaction with the input received from HIPS?"

Participant confidence was measured by asking, using a 5-point Likert scale (1 = extremely unconfident, 2 = unconfident, 3 = neither confident nor unconfident, 4 = confident, 5 = extremely confident) "How would you rate your confidence in putting in place the pain management strategies discussed with the HIPS team?"

Use of pain management strategies (percentage) was calculated from the number of chosen strategies on the treatment plan from assessment that were currently being implemented.

Wait-time was calculated as number of days from the education and orientation group to first offer of assessment and also to actual assessment.

Group Versus Individual Assessment Format

Group Assessment

The small group assessment was designed to facilitate a patient centered approach and develop concepts initially presented in the education and orientation group. Evidence-based information and support were given by clinical staff to assist participants to self-assess their situation and take responsibility for developing their own treatment plans. An identical treatment plan template was used for both group and individual assessment formats (Table A2: Pain treatment plan). The template could be individualized by ticking boxes to indicate issues identified as well as recommended self-management strategies. The template also included options for attending further pain service group or individual intervention.

The 5-hour group assessment was delivered on a single weekday and participants were invited to bring a support person, such as a family member or close friend. The aim was for 8–10 participants to attend each group assessment. Due to consistent non-attendance, an over-booking policy was adopted with up to 12 people routinely booked for each group. The group

commenced with a 15 minute introduction including welcoming orientation statements of what to expect and encouraging interaction. Participants were advised to keep comfortable by breaking up their sitting throughout the day. This was followed by 3 x 75 minute interactive sessions separated by a 15 minute morning tea and 30 minute lunch break. Two clinicians (pain management physiotherapist and clinical nurse specialist or clinical psychologist) remained with the group for the whole day. When not directly presenting, clinician observations were noted for later inclusion in the summary report. Clinicians also helped participants complete treatment plans as required.

Session one was delivered by a pain medicine specialist. Content included the neurophysiology of pain, red flags, and the limitations of medical treatments (procedural, surgical, and medication) in the setting of chronic non-cancer pain. Participants were provided with written advice regarding the likelihood of problematic medication use. Medication use was judged as likely to be problematic if referral information listed an oral morphine equivalent daily dose (oMEDD) of 60 mg or more; acetaminophen use greater than 4 grams daily, or regular benzodiazepine use. The concept of rationalizing medication was discussed and the possibility of weaning and cessation raised. Next, participants were introduced to the mindbody aspect and discussion of the possible impact of traumatic life events, stress, and personality style. A brief nutrition segment followed and participants were guided through a self-assessment of current food intake. Topics covered included macronutrient balance, vegetable intake, refined foods, fluid intake (sugar containing soft drinks versus water), and use of supplements such as omega 3 fish oil. Strategically, it was considered important for the pain medicine specialist to validate the shift beyond focused biomedical treatment and to endorse a broader management approach. During the session participants were encouraged to identify a range of problems along with appropriate actions to address them. The treatment plan template was used as a guide. For example, a participant might identify nervous system sensitization as a contributory problem and then opt for the use of a broad approach to desensitize their nervous system aiming to reduce pain. Another option was to identify problematic opioid use and subsequently speak with their GP about opioid weaning.

Session two was delivered by a pain management physiotherapist. Participants were asked to assess if they were meeting National Physical Activity Guidelines [29] and their sedentary behavior in sitting and lying. Participants were then guided through a self-assessment to detect any issues with flexibility, lower limb strength (inability to rise independently from a chair), balance (inability to maintain single leg stance), and waist measurement. The concept of "pacing" was briefly introduced to encourage regular planned physical activity at manageable levels without flare-up. Planned daily walks were specifically endorsed. A basic stretch series was practiced and a physical activity planner was provided [30].

Session three was delivered by a clinical psychologist or clinical nurse specialist. Content included pain flare-up and the impact of pain on emotional, cognitive, behavioral, occupational, and social functioning. Participants were provided with individual feedback on their likelihood of having a problem with depression and/or anxiety, and maladaptive cognitions based on K10 and PSEQ baseline scores. Participants were then guided to self-assess whether they felt they had a problem with: depression or anxiety; confidence in coping with pain, sleep; caffeine use, alcohol intake, nicotine, other drug use; issues with relationships/intimacy and/or loss of daily social or meaningful activity. Participants were asked to select from a range of strategies to address any identified issues. Participants were also introduced to a slow, controlled breathing cycle to aid relaxation.

At the end of the group assessment, 15 minutes were set aside to formally close the program. Participants were asked to choose whether they wished to attend further pain service groups or any individual interventions or whether they opted for discharge to primary care. In addition, participants were given the option to receive a telephone call from a HIPS clinician to discuss their treatment plan and any other concerns. Participants were encouraged to discuss the treatment plan with their GP.

After participants departed, clinical staff met to discuss each case. The pain medicine specialist made additional notes regarding medication reduction strategy for inclusion in the one page summary report. This individualized report was written by the pain management physiotherapist on behalf of the team, based on information obtained from the referral, hospital medical record, the participant's treatment plan, plus staff observations and specific data collected during the group assessment. The report and a copy of the treatment plan were sent to the GP. The estimated cost per participant assessed in this format was $AUD 171.55 (Table A3).

Individual Assessment

Conventional multidisciplinary assessment consisted of three participants rotating through a series of three 1-hour interviews. In no particular order, participants were assessed by: a pain medicine specialist; a clinical psychologist, intern psychologist, or psychiatrist; and a pain management physiotherapist. The assessments typically occurred on a single day. Participants were invited to bring a family member or close friend. The assessment gathered each participant's history including the functional impacts of pain and current coping skills. At the time of interview the health professionals discussed potential interventions with the participant. Following the assessment and the participant's departure, the health professionals held a multidisciplinary

team discussion and completed the treatment plan template. A comprehensive report by the pain medicine specialist was sent to the participant's GP. Copies of the treatment plan were sent to both GP and participant. The estimated cost per participant assessed in this format was $AUD 441.45 (Table A3).

Hunter New England Health outpatient discharge policy stipulates that patients be discharged after failure to attend two scheduled appointments without adequate explanation. Thus, these non-attendees (at either assessment format) were considered to have dropped out of the study.

Statistical Analysis

Data from questionnaires and phone calls were entered into a secure database and analyzed by a researcher who was not involved in clinical implementation of the study. Analyses were conducted using software packages SPSS Version 21 [31] and JMP Version 11 [17].

Treatment of missing data was questionnaire specific. With the PSEQ [25], for individuals missing one item, the average of their other items was imputed and a total score was calculated. A personal communication email received from Nicholas (2014) confirms that pro-rating data within a particular case is defensible, given the items of the PSEQ have a fairly high item-total correlation. Individuals with more than one missing item were excluded from the analyses. Using this method, missing data were entered for eight participants at baseline and five participants at follow-up.

Missing items on the K10 [27] were excluded from the calculation of the total score, as recommended by Coombs [32]. Using this method, missing data were entered for 11 participants at baseline and two participants at follow-up.

With BPI [22] Cleeland's user guide was followed for treatment of missing data [33]. To ensure validity, all four of the severity subscale items need be answered for the total score to be calculated. Thus, patients with any items missing were excluded from the analyses. For the interference subscale, at least four of the seven need to be completed for the total score to be calculated. Using the method described above, missing data were entered for 10 participants at baseline and one participant at follow-up, for the interference subscale.

Effects were deemed statistically significant if $P < 0.05$. Baseline socio-demographic and clinical pain characteristics of the participants, non-participants, and the two assessment groups were computed using mean and standard deviations for continuous variables and in the event of categorical data, frequencies and percentages. Tests of normality (Shapiro-Wilk) were conducted to determine distribution of the data for each continuous outcome variable. To assess the relationship between participants and non-participants, independent samples t-tests and where appropriate the non-parametric equivalent (Mann-Whitney test) were used for continuous variables. Chi Square tests were used (with Monte-Carlo test where assumptions were not met) for categorical data. These analyses were also conducted to determine baseline differences between those assigned to individual and group assessment formats. In addition, the same analyses were used to investigate the differences in baseline characteristics of those participants who attended their assessment and those who did not, in order to assess selection bias.

Following this, the distribution of baseline and follow-up data for each of the outcome measures and health utilization variables were tested using Shapiro-Wilk analyses. For intra-group comparisons over time, paired samples t-tests and where appropriate the non-parametric equivalent (Wilcoxon Signed Ranks Test) were used to test for differences between outcome measures at baseline and follow-up.

For between group comparisons over time, difference scores for each outcome variable were calculated by subtracting the baseline score from the follow-up score for each participant. The distribution of the difference was then tested for normality using the Shapiro-Wilk test. If the distribution was considered normal, a t-test was performed to assess the difference of change between the individual and group assessments. If the distribution was considered skewed, the non-parametric equivalent, the Wilcoxon, was performed.

Results

Recruitment and Participant Flow

The flow of participants through the study is shown in Figure 2. Recruitment took place from August 16, 2010 to December 10, 2012. A total of 211 participants were assigned to either group or individual assessment. Subsequently 72 participants attended group assessment and 90 attended individual assessment. The mean number of attendees at each group assessment was six (range 3–11). Follow-up telephone data were collected from 57 group and 72 individual assessment participants. Follow-up questionnaire data were collected from 40 group and 49 individual assessment participants. Post hoc power analyses for key outcome measures are presented in Tables 1–3 with power ranging from 60–91%.

Differences Between Participants and Non-Participants

Study participants (n = 211) were compared with those who chose not to participate (n = 207) on all baseline variables. Mann-Whitney, independent samples t-tests, and Chi Square analyses revealed non-participants were more likely than their participant counterparts to: take

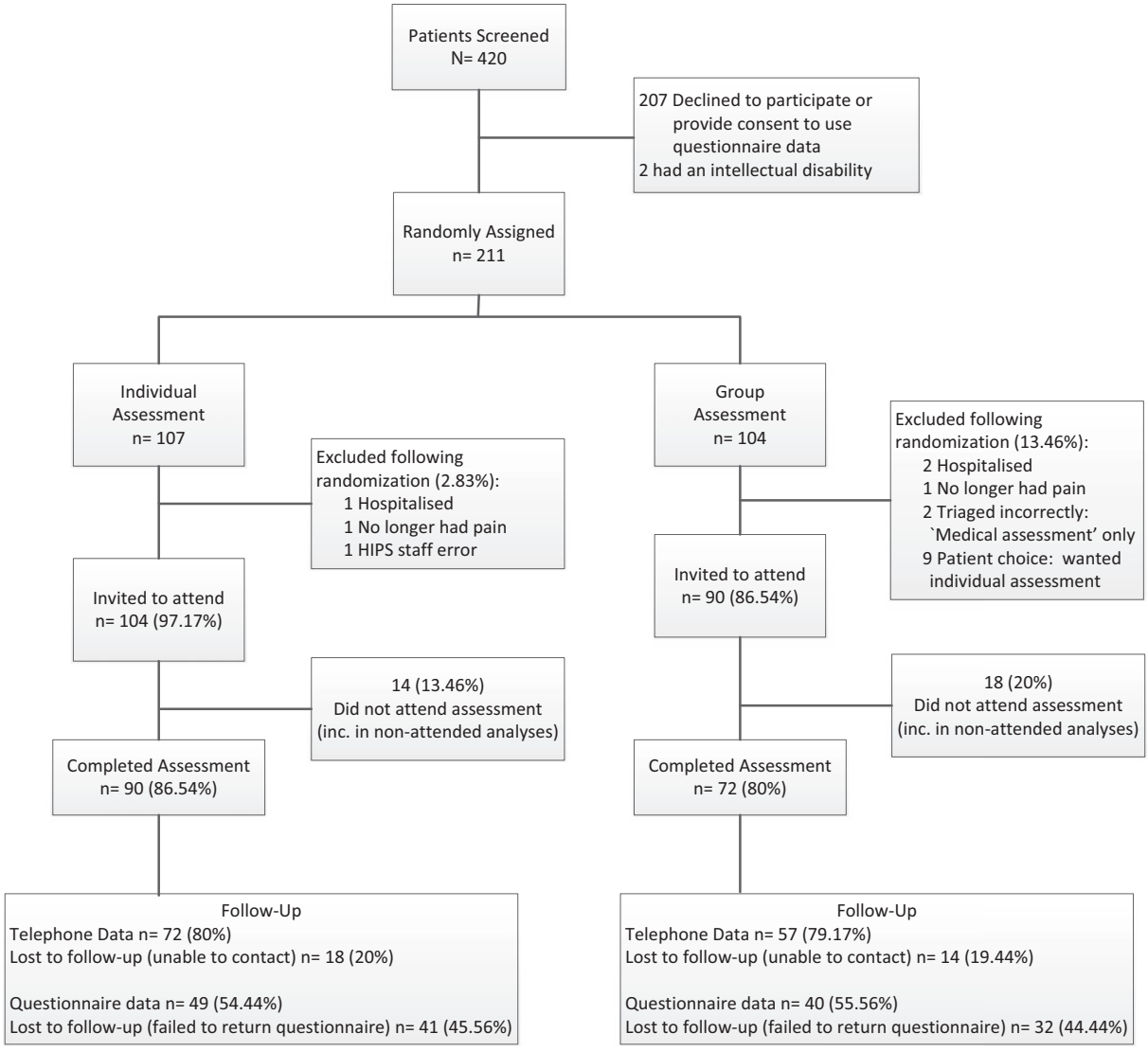

Figure 2 Participant flow.

opioid medication ($\chi^2_1 = 10.762$, $P = 0.001$); take higher morphine equivalent doses ($Z = -3.129$, $P = 0.002$); see other health professionals less frequently ($Z = -2.080$, $P = 0.038$); and have lower pain self-efficacy ($Z = -2.382$, $P = 0.017$).

Baseline Differences Between Group and Individual Assessment Participants

Mann-Whitney, independent samples t-tests, and Chi Square analyses revealed no significant differences between the group and individual assessment cohorts (Table A4). All participants had chronic non-cancer pain (pain duration > 3 months), with the majority (64.4%) of participants having experienced pain for over 3 years. Of these, over half reported experiencing pain for over 10 years (Table A4). On average, participants reported 4.97 sites of pain, with the main site of pain reported as lower back (20%), followed by the combination of lower back and lower limbs (18%). Psychological distress was in the high range on average for participants as measured on the K10 (Table A4).

Attenders and Non-Attenders

Study participants who were invited to assessment and attended (n = 162) and those who were invited and failed to attend (n = 32) were compared on all variables. The Mann-Whitney, independent samples t-tests, and Chi Square analyses revealed no significant differences between the two groups.

Table 1 Intra-group differences in outcome for individual and group assessment

Variable	Baseline† median (interquartile range)	Follow-up median (interquartile range)	Test statistic	Power (%)
K10				
IA (n = 41)	31 (13.50)	26.50 (13)	t(40) = 2.243, $P = 0.031$	88
GA (n = 32)	32 (15)	29 (13.75)	t(32) = .590, $P = 0.559$	80
PSEQ				
IA (n = 44)	22 (15)	25 (23.50)	t(43) = −2.934, $P = 0.005$	90
GA (n = 37)	19.5 (18.25)	24 (19.25)	t(36) = −3.472, $P = 0.001$	84
BPI interference*				
IA (n = 47)	7.29 (2.50)	7.14 (2.96)	z = −1.535, $P = 0.125$	91
GA (n = 38)	8 (2.57)	7.14 (3)	z = −2.413, $P = 0.016$	83
BPI severity				
IA (n = 46)*	6.75 (1.81)	6.50 (2.13)	z = −2.324, $P = 0.020$	90
GA (n = 37)	6.50 (2)	6.25 (2.50)	t(36) = .842, $P = 0.405$	84
GP visits*				
IA (n = 43)	4 (5)	3 (3)	z = −2.861, $P = 0.004$	88
GA (n = 34)	4 (3)	3 (4)	z = −3.383, $P = 0.001$	79
Specialist visits*				
IA (n = 44)	1 (2)	0 (1)	z = −2.237, $P = 0.025$	86
GA (n = 35)	1 (1)	0 (1)	z = −2.184, $P = 0.029$	80
Other health professionals*				
IA (n = 43)	1 (4)	1 (4)	z = −.023, $P = 0.982$	88
GA (n = 36)	2 (7)	0 (3)	z = −2.135, $P = 0.033$	81

IA = individual assessment; GA = group assessment; K10 = kessler psychological distress Scale-10; PSEQ = pain self-efficacy questionnaire; BPI = brief pain inventory; GP = general practitioner.
*The non-parametric equivalent, Wilcoxon test used as the distribution of this variable was statically skewed.
†Baseline medians based on participants who provided both pre and post data.

Intragroup Differences

The intragroup differences from baseline to 3 month follow-up are presented in Table 1. An analysis of the intragroup changes using paired t-tests and where appropriate the non-parametric equivalent (Wilcoxon Signed Ranks Test) demonstrated that for the group assessment, statistically significant improvements were observed for pain interference (BPI Interference Subscale), pain self-efficacy (PSEQ), number of GP, specialist, and other health professional visits. Differences in psychological distress (K10) and pain severity (BPI Severity Subscale) were not significant.

The individual assessment achieved statistically significant improvements in psychological distress (K10), severity of pain (BPI Severity Subscale), pain self-efficacy (PSEQ), and reduction in visits to the GP and specialist(s). Differences from baseline to follow-up for interference with pain (BPI Interference) and visits to other health professionals were not significant.

Between Group Differences

As is demonstrated in Table 2, t-tests and Wilcoxon tests revealed no significant differences between the two assessment formats for change in any of the clinical outcome measures or health utilization indicators following assessment.

As demonstrated in Table 3, Mann-Whitney analyses revealed no significant differences between the assessment formats in level of satisfaction, level of confidence in implementing pain self-management strategies, or percentage of pain self-management strategies implemented.

Mann-Whitney tests revealed a significant difference between individual and group assessment in number of days from attending the education and orientation group to the first offer of assessment and also to the date of actual attendance (Table 3). Those attending the group assessment accessed their assessment faster than those attending the individual format.

Discussion

The high societal burden of pain and related disability [1,34] highlights the need for thoughtful review of existing models of service delivery. This study builds upon previous research that explored the use of pre-assessment groups in multidisciplinary pain services [9,10].

Table 2 Between group differences for level of change following assessment

Variable	Assessment format		Test statistic	Power
	Individual assessment Median (interquartile range)	Group assessment Median (interquartile range)		
K10*	−3 (10.5)	−2 (10)	$\chi^2_1 = 0.6164$, $P = 0.4324$	66
PSEQ	4.5 (16.75)	6 (12)	t (77.56) = −0.13446, $P = 0.89343$	60
BPI interference*	−2.9 (1.71)	−.5 (2.07)	$\chi^2_1 = 0.5096$, $P = 0.4765$	71
BPI severity*	−.38 (2.56)	−.21 (1.88)	$\chi^2_1 = 1.5016$, $P = 0.2204$	71
GP visits*	−1 (3)	−1 (3)	$\chi^2_1 = 0.7815$, $P = 0.3767$	67
Specialist visits*	−.50 (1)	0 (1)	$\chi^2_1 = 0.0052$, $P = 0.9427$	69
Other health professionals*	0 (4)	0 (4)	$\chi^2_1 = 3.6334$, $P = 0.0566$	69

K10 = kessler psychological distress Scale-10; PSEQ = pain self-efficacy questionnaire; BPI = brief pain inventory; GP = general practitioner.
*The non-parametric equivalent, Wilcoxon test used as the distribution of this variable was statically skewed.

Table 3 Between group differences for satisfaction, confidence, percentage of self-management strategies following assessment and wait-time for assessment

Variable	Assessment format				Test statistic	Power
	Individual assessment		Group assessment			
	(N)	Median (interquartile)	(N)	Median (interquartile)		(%)
Confidence*	73	4 (2)	59	4 (1)	$z = -1.197$, $P = 0.231$	79
Satisfaction*	73	4 (2)	60	4 (2)	$z = -0.134$, $P = 0.894$	79
Percentage of strategies*	72	73.86 (29.75)	56	66.67 (26.92)	$z = -1.723$, $P = 0.085$	78
Days wait to offer of assessment*	100	144 (87)	88	47 (55)	$z = -8.993$, $P < 0.001$	91
Days wait to actual assessment*	85	162 (84)	70	58.50 (58)	$z = -8.049$, $P < 0.001$	85

*The non-parametric equivalent, Mann-Whitney test used as the distribution of this variable was statically skewed.

Specifically this study demonstrates the successful implementation of a group assessment format within a stepped care approach. The group assessment format was associated with a reduction in wait-time while delivering comparable clinical outcomes to individual assessment. This challenges the traditional view that individual multidisciplinary assessment is a prerequisite for effective pain management.

Wait-time from the education and orientation group to group assessment was significantly shorter than wait-time to individual assessment. Two main factors were thought to contribute. Firstly the ability for clinicians to manage multiple patients simultaneously in the group format reduced the bottleneck of patients waiting for individual multidisciplinary assessment. Secondly, the capacity to overbook groups reduced the impact of participant non-attendance. While it was beyond the scope of this study to analyze these factors in detail, future research could examine process flow and resource utilization [8] across group and individual assessment formats.

Comparisons within both assessment formats revealed statistically significant improvements in clinical outcome measures. However, these changes were not considered clinically significant. This is not surprising given the brevity of the assessment "intervention" and the limited follow-up period involved. Nevertheless it is interesting to note that assessment has the potential to bring therapeutic gain.

As hypothesized, clinical outcomes were comparable for group and individual assessment in terms of pain severity, pain interference, pain self-efficacy, psychological distress, and health care utilization. In addition, participants attending group assessment were equally satisfied with the intervention, were equally confident in their ability to implement self-management strategies, and implemented an equal percentage of chosen strategies as those undertaking individual assessment.

Health care utilization in the 3 months prior to follow up reduced for both arms of the study. Both assessment formats reduced GP as well as specialist attendance

(Table 1). Group assessment also showed a reduction of two in median number of visits to other health professionals. These reductions in health care utilization are of particular interest given the societal burden of pain and disability [34] and the challenges of working at the interface of specialist and primary health care [35].

The strengths of this research include rigorous methodology, the real world clinical setting, successful randomization of adults presenting to a tertiary pain service, blinded collection of follow-up data and the use of valid and reliable outcome measures.

Of interest, the study explored the practicality of assessing for "red flag" conditions in a group setting. Although the validity and usefulness of red flags have been questioned [36], the failure to screen for risk may have serious clinical implications. To counter this, the possibility of red flags was specifically addressed in the group assessment format during the pain medicine specialist session. Participants were guided to assess possible red flags and identify them accordingly on their treatment plan, ready for discussion with the pain medicine specialist or their GP. During the study period no previously unrecognized red flag conditions were identified in either assessment format. This is in line with a recent review showing an extremely low likelihood of subsequently identifying harmful underlying conditions missed at initial primary care assessment [37].

A limitation of this study is the reduced statistical power. Despite recruiting above the target sample size, participant exclusion and number of participants lost to follow-up affected statistical power. A number of participants were excluded from the study following randomization, but prior to their assessment (Figure 2). This reduced the number of participants attending their assessment, which then reduced the amount of follow-up data potentially available. Nine participants in particular requested individual assessments once assigned to the group assessment. This may relate to common misconceptions surrounding group settings and the group experience. For example, many people perceive group interventions to be "second-rate", despite research suggesting that group approaches are more effective or at least comparable to individual interventions [38,39]. Others fear the experience will be detrimental to their wellbeing due to possible contagion [40]. However, it is important to note that those who attended the group assessment rated their satisfaction with the assessment as acceptable and at levels comparable to individual assessment. Addressing negative expectations at an early point in the model of service delivery may help to maximize engagement with the group process.

Furthermore, a number of participants were lost to follow-up as they failed to return their questionnaire or were unable to be contacted by telephone, despite several attempts. This reduced available data and power of the post-assessment analyses, in particular for the between subjects comparisons. The loss of follow-up data is reflective of the high dropout rate from pain clinics in general and poor patient retention in the interface between specialist and primary care [35]. Future research needs to ensure adequate numbers are recruited to obtain sufficient follow-up data.

Conclusions

The group assessment format reduced wait-times while delivering otherwise comparable clinical outcomes and participant satisfaction for people experiencing chronic non-cancer pain. Group assessment has the potential to provide a viable alternative to conventional individual assessment.

This study builds upon previous research exploring the use of pre-assessment groups in multidisciplinary pain services [9,10]. Further work is needed to explore the efficacy and cost effectiveness of a complete stepped model of service delivery for chronic non-cancer pain that incorporates both assessment and management phases. In addition, it would be of interest to explore the potential for group assessment in other chronic diseases. Group medical visits for patient populations with diabetes [41] and cardiac conditions [42] have proven effective and gained popularity. To date, however, group medical visits have typically been used for follow-up appointments only and their role in initial assessment is unclear [43].

Acknowledgments

We wish to express our grateful thanks to the entire team at Hunter Integrated Pain Service who were instrumental in the implementation of this study. We also wish to thank Nic Croce for assistance with statistical analysis and interpretation.

References

1 Blyth FM, March LM, Cousins MJ. Chronic pain-related disability and use of analgesia and health services in a Sydney community. Med J Aust 2003; 179(2):84–7.

2 Hogg M, Gibson S, Helou A, DeGabriele 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.

3 Lynch ME, Campbell F, Clark AJ, et al. A systematic review of the effect of waiting for treatment for chronic pain. Pain 2008;136(1-2):97–116.

4 Bonica JJ. Multidisciplinary/interdisciplinary pain programs. In: Bonica JJ, Loeser JD, Chapman CR, Fordyce WE, eds. Management of Pain. Philadelphia: Lea and Febiger;1990:197–208.

5 Bodenheimer T, Wagner EH, Grumback K. Improving primary care for patients with chronic illness: The chronic care model, Part 2. J Am Med Assoc 2002;288(15):1909–14.

6 Stein T, Nagy VT, Jacobs L. Caring for patients one conversation at a time: Musings from the interregional clinical-patient communication leadership group. Perm J 1998;2:62–8.

7 Haig AJ, Nagy A, LeBreck DB, Stein GL. Outpatient planning for persons with physical disabilities: A randomised prospective trial of physiatrist alone versus a multidisciplinary team. Arch Phys Med Rehab 1995;76:341–8.

8 Williams KA, Chambers CG, Dada M, et al. Applying JIT principles to resident education to reduce patient delays: A pilot study in an academic medical centre pain clinic. Pain Med 2015;16:312–8.

9 Hayes C, Hodson FJ. A whole-person model for care for persistent pain: From conceptual framework to practical application. Pain Med 2011;12:1738–49.

10 Davies S, Quinter J, Parsons R, et al. Preclinic group education sessions reduce waiting times and costs at public pain medicine units. Pain Med 2011;12:59–71.

11 Mitchell AJ, Selmes T. Why don't patients attend their appointments? Maintaining engagement with psychiatric services. Adv Psychiatr Treat 2007; 13:423–34.

12 Von Korff M, Moore JC. Stepped care for back pain: Activating approaches for primary care. Ann Intern Med 2001;134(9):911–7.

13 Pruitt SD, Epping-Jordan JJ. Preparing the 21st century global healthcare workforce. BMJ 2005; 330:637–9.

14 Elwyn G, Laitner S, Coulter A, et al. Implementing shared decision making in the NHS. BMJ 2010; 341(7780):971–3.

15 Linton SJ, Boersma K, Jansson M, Svärd L, Botvalde M. The effects of cognitive-behavioral and physical therapy preventive interventions on pain-related sick leave: A randomized controlled trial. Clin J Pain 2005;21(2):109–19.

16 Faul F, Erdfelder E, Buchner A, Lang AG. Statistical power analyses using G*Power3.1: Tests for correlation and regression analyses. Behav Res Meth 2009;41:1149–60.

17 JMP Versions 9 & 11. SAS Institute Inc., Cary, NC 1989–2007.

18 Hunter Integrated Pain Service. Understanding Pain. 2014. Available at: http://www.hnehealth.nsw.gov.au/Pain/Pages/Community-resources.aspx (accessed February 1, 2015).

19 Moseley GL, Nicholas MK, Hodges PW. A randomized controlled trial of intensive neurophysiology education in chronic low back pain. Clin J Pain 2004;20:324–30.

20 Van Oosterwijck J, Meeus M, Paul L, et al. Pain physiology education improves health status and endogenous pain inhibition in fibromyalgia: A double -blind randomized controlled trial. Clin J Pain 2013; 29:873–82.

21 Cleeland CS, Ryan KM. Pain assessment: Global use of the brief pain inventory. Ann Acad Med 1994; 23(2):129–38.

22 Keller S, Bann CM, Dodd SL, et al. Validity of the brief pain inventory for use in documenting the outcome of patients with noncancer pain. Clin J Pain 2004;20(5):309–18.

23 Tan G, Jensen MP, Thornby JI, Shanti BF. Validation of the brief pain inventory for chronic nonmalignant pain. J Pain 2004;5(2):133–7.

24 Asghari A, Nicholas MK. Pain self-efficacy beliefs and pain behaviour. A prospective study. Pain 2001; 94:85–100.

25 Nicholas MK. The pain self-efficacy questionnaire: Taking pain into account. Eur J Pain 2007; 11(2):153–63.

26 Andrews G, Slade T. Interpreting scores on the Kessler Psychological Distress Scale (K-10). Aust NZ J Pub Health 2001;25:494–7.

27 Kessler R, Andrews G, Colpe L, et al. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. Psychol Med 2002;32:959–76.

28 Kessler RC, Barker PR, Colpe LJ, et al. Screening for serious mental illness in the general population. Arch Gen Psychiat 2003;60:184–9.

29 Department of Health and Ageing. 1999. National Physical Activity Guidelines for Adults. Available at: www.health.gov.au/internet/main/publishing.nsf/content/health-pubhlth-strateg-phys-act-guidelines#a-paadult (accessed July 17, 2014).

30 Australian Government Department of Veterans' Affairs Department of Health and Ageing. 2005. Choose Health: Be Active. A Physical

Activity Guide for Older Australians. Available at: http://www.health.gov.au/internet.main/publishing.nsf/Content/phd-physical-choose-health (accessed March 10, 2014).

31 IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.

32 Coombs T. Australian Mental Health Outcomes and Classification Network. Kessler-10. Parramatta, NSW: NSW Institute of Psychiatry; 2005.

33 Cleeland CS. The Brief Pain Inventory user guide. 2009. Available at: www.mdanderson.org/education-and-research/departments-programs-and-labs/departments-and-divisions/symptom-research/symptom-assessment-tools/BPI_UserGuide.pdf (accessed February 12, 2014).

34 Blyth FM, March LM, Brnabic AJM, et al. Chronic pain in Australia: A prevalence study. Pain 2001; 89:127–34.

35 Mitchell GK. Improving coordination of care between specialist and general practice for people with chronic pain. Med J Aust 2013;198(6):2–3.

36 Henschke N, Maher CG, Ostelo RWJG, et al. Red flags for malignancy in patients with low-back pain (Review). Cochrane Database Syst Rev 2013; 2:CD008686.

37 Kroenke K. A practical and evidence-based approach to common symptoms: A narrative review. Ann Intern Med 2014;161:579–86.

38 Meineche-Schmidt V, Jensen N, Sjøgren P. Long-term outcome of multidisciplinary intervention of chronic non-cancer pain patients in a private setting. Scand J Pain 2012;3:99–105.

39 Rose MJ, Reily JP, Pennie B, et al. Chronic low back pain rehabilitation programs: A study of the optimum duration of treatment and a comparison of group and individual therapy. Spine 1997;22(19):2246–53.

40 Bowden M. Anti-group attitudes and assessment for psychotherapy. Psychoanal Psychother 2002; 16:246–58.

41 Housden L, Wong ST, Dawes M. Effectiveness of group medical visits for improving diabetes care: A systematic review and meta-analysis. Can Med Assoc J 2013;185(13):E635–44.

42 Bauer Bartley K, Haney R. Improving access, outcomes, and satisfaction for patients with chronic cardiac diseases. J Cardiovas Nurs 2010;25(1):13–9.

43 Egger G, Binns A, Cole MA, et al. Shared medical appointments: An adjunct for chronic disease management in Australia? Aust Fam Physician 2014; 43(3):151–4.

APPENDIX

Table A1 Follow-up telephone script

Telephone Interview Schedule

Date: _____ Participant No:

Good morning / good afternoon, my name is XXXX (insert name of placement student), I am currently completing a placement at the Hunter Integrated Pain Service. Firstly, we would like to thank you for participating in the study: Assessment vs Treatment: Improving Outcomes in a Multidisciplinary Pain Clinic. Your participation in this study is providing the clinic with valuable information about service delivery.

If participant has returned the questionnaire:

I would also like to thank you for taking the time to complete and return the questionnaire to us.

Would you be willing to answer three further questions over the phone? This will take about 5 minutes?

1) On a scale of 1 to 5, with 1 being "Strongly Dissatisfied" to 5 being "Extremely Satisfied", how would you rate your satisfaction with the input received from HIPS?

Strongly Dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Extremely Satisfied
1	2	3	4	5

Check to ensure that the number they picked corresponds to scale, 'So you feel…with the input received from HIPS'.

2) On a scale of 1 to 5, with 1 being "Extremely Unconfident" to 5 being "Extremely Confident", how would you rate your confidence in putting into place the pain management strategies discussed with the HIPS team?

Extremely Unconfident	Unconfident	Neither confident nor unconfident	Confident	Extremely Confident
1	2	3	4	5

Check to ensure that the number they picked corresponds to scale, 'So you feel…in implementing the pain management strategies discussed with the HIPS team'.

3) From the x strategies (insert total number of strategies the individual participant planned to do on their management plan) you planned on your management plan, how many have you completed (prompt as to each strategy if needed).

Thank you for your time today and for having participated in the research.

If participant has not returned the questionnaire:

I am wondering if you received the follow-up review questionnaire in the mail:

If they DID NOT receive the questionnaire: Would you be willing to complete the questionnaire and return it to HIPS if I were to send you out another copy, with a prepaid envelope for you to return it OR OR would you prefer me to provide some assistance in completing this form over the phone now?

If they DID: Would you consider filling this questionnaire in and returning it to HIPS using the reply paid envelope, OR would you prefer me to provide some assistance in completing this form over the phone now?

Following completion of questionnaire/patients agreement to return it to HIPS ask/participant declining to complete the questionnaire...:

Would you be willing to answer three further questions over the phone. This will take about 5 minutes?

1) On a scale of 1 to 5, with 1 being "Strongly Dissatisfied" to 5 being "Extremely Satisfied", how would you rate your satisfaction with the input received from HIPS?

Strongly Dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Extremely Satisfied
1	2	3	4	5

Check to ensure that the number they picked corresponds to scale, 'So you feel…with the input received from HIPS'.

2) On a scale of 1 to 5, with 1 being "Extremely Unconfident" to 5 being "Extremely Confident", how would you rate your confidence in putting into place the pain management strategies discussed with the HIPS team?

Extremely Unconfident	Unconfident	Neither confident nor unconfident	Confident	Extremely Confident
1	2	3	4	5

Check to ensure that the number they picked corresponds to scale, 'So you feel…in implementing the pain management strategies discussed with the HIPS team'.

3) From the x strategies (insert total number of strategies the individual participant planned to do on their management plan) you planned on your management plan, how many have you completed (prompt as to each strategy if needed).

To all participants

Thank you for your time today agreeing to complete this survey with me.

Do you have any other questions? If so, forward names to Meredith Jordan (Clinical Psychologist) at HIPS and inform participant that Meredith will contact them by phone to discuss.

If appropriate: We look forward to receiving your questionnaire in the mail.

Goodbye.

Table A2 Pain treatment plan

Name: _____ Date:_____

Issues around my pain and health	What will I do? *(color my priorities)*
My Pain Management Action Plan	
Biological	☐ Read "Understanding Pain"
• Sensitization in nervous system	☐ Use a broader approach to de-sensitize the nervous system
• Red flags present	☐ Talk to GP about red flags/procedures
• Indications for surgery	☐ Read "Medication and Persistent Pain"
• Indications for nerve blocks	☐ Talk to GP about medication changes (opioid risk assessment, prescription and/or rotation, different medication groups, trial of taper and cease)
• Difficulties with medication	*Telephone and Website support from HIPS is available for GPs as required. Opioid Risk Tool. Opioid Use in Persistent Pain Guideline*
	☐ Other:
Story	☐ Read "My Story"
Current stress	☐ Work on a timeline of my life and health events
Changes to pain or health following specific life events	☐ Make time for stillness
	☐ Try some journaling
	☐ HIPS story group
	☐ See a psychologist
	☐ Obtain the "Exploring the mindbody in persistent pain" self-help workbook available on request from HIPS office
	☐ Other:
Nutrition	☐ Read "Nutrition and Pain"
Balance of protein/carbohydrate/fat	☐ Use the new food pyramid
	☐ Increase water intake to eight glasses/day (e.g., carry bottle of water with me)
Daily water intake	☐ Eat two fruit and five veggie servings/day
Fruit and vegetable intake	☐ Trial fish oil (2,000 mg twice daily) and a daily multivitamin
Supplements such as fish oil and multivitamins	☐ Take and use the nutrient content card when shopping
	☐ Contact Get Healthy information line on 130-080-6258
	☐ HIPS referral to free weight management clinic (dietician)
	☐ Other:
Actions	☐ Read "Manage Your Pain" or "Living Well with Pain and Illness" (library or purchase)
Resting	☐ Monitor resting with monthly activity planner
Pain neutral	☐ Write down and observe pain neutral
Exercise	☐ Stretches and exercises from Lifestyle and Pain workbook
Posture	☐ Daily walk while keeping comfortable
Daily walk	☐ Moving with Pain group at HIPS
Waist measurement cm	☐ Moving with Pain with a local physiotherapist (HIPS/GP will refer you)
	☐ Exercise program in the community (choose from available resources)
	☐ Other:
Thoughts and emotions	☐ Read information on depression and anxiety
Depression and anxiety	☐ Internet treatment programs (see resource sheet)
Confidence and thinking	☐ Living with Pain group at HIPS
	☐ Psychology services free at local community health center (49257990) or via GP referral through Better Access to Medicare scheme (see handout)
	☐ Other:
Healthy habits	☐ Relaxation exercises from Lifestyle and Pain workbook
Relaxation	☐ Read information on sleep strategies (handout, book, or CD from library)
Sleeping	☐ Read information on caffeine (reduce to under four cups a day/try decaf or herbal tea)
Caffeine	☐ Keep alcohol within Australian Guidelines (two standard drinks/day)
Alcohol	☐ Call QuitLine on 131848 for a quit pack or talk to GP about nicotine replacement
Smoking	
Other drugs	
Pacing	

(continued)

Table A2 Continued

Name: _____ Date:_____

Issues around my pain and health	What will I do? *(color my priorities)*
Activities Relationships Sex	☐ Read information on recreational drug use (Drug and Alcohol Service: 1800052222) ☐ Living With Pain group at HIPS ☐ Further discuss relationship or intimacy issues with relevant persons/contact relationship counselor ☐ Other:

Goal: *If you were managing your pain better, what would you like to achieve in the next 6 months?*
It is important to discuss this pain management action plan with your GP.
A copy will be mailed to your GP by HIPS.
If you want a follow-up phone call from HIPS to discuss this plan tick here ☐

Table A3 Assessment time and cost

Group assessment time and costs

Staff member	Time	Total hours	Hourly rate ($AUD)	Total cost ($AUD)
Physiotherapist		9 hours 15 minutes	$46.32	$428.46
Program:				
Introduction	15 minutes			
3 x 1 hour 15 minute sessions	3 hours 45 minutes			
Conclusion	15 minutes			
End of day meeting/notes	1 hour			
Reports/admin (40 mins/patient)	4 hours			
Clinical psychologist/clinical nurse specialist		6 hours 15 minutes	$54.93/$43.26	$343.31/$270.31
Preparation	1 hour			
Program:	15 minutes			
Introduction	3 hours 45 minutes			
3 x 1 hour 15 minute sessions	15 minutes			
Conclusion	1 hour			
End of day meeting/notes				
Pain medicine (staff) specialist		2 hours 30 minutes	$83.19	$207.98
Program:				
Introduction	15 minutes			
1 x 1 hr 15 minute session	1 hour 15 minutes			
End of day meeting/notes	1 hour			
Administration officer		2 hours	$24.78	$49.56
Mailing appointment letters	1 hour			
Printing and mailing reports	1 hour			
Total				
Per six participants		20 hours		$1029.31/$956.31
Per participant		3 hours 20 minutes		$171.55/$159.39

(continued)

Table A3 Continued

Individual assessment time and costs Staff member	Time	Total hours	Hourly rate ($AUD)	Total cost ($AUD)
Physiotherapist		2 hours 15 minutes	$46.32	$104.22
Preparation	15 minutes			
Appointment	1 hour			
Case discussion/notes	1 hour			
Clinical psychologist/psychiatrist		2 hours 15 minutes	$54.93/$83.19	$123.59/$187.18
Preparation	15 minutes			
Appointment	1 hour			
Case discussion/notes	1 hour			
Pain medicine (staff) specialist		2 hours 25 minutes	$83.19	$201.05
Preparation	15 minutes			
Appointment	1 hour			
Case discussion/notes	30 minutes			
Dictation and review of letter	40 minutes			
Administration officer		30 minutes	$24.78	$12.39
Appointment booking	10 minutes			
Letter administration	20 minutes			
Total per participant		7 hours 25 minutes		$441.45/$504.84

Table A4 Baseline characteristics for individual and group assessment participants

Variable	Total sample ($N = 194$)	Individual assessment (n = 104)	Group assessment (n = 90)	Individual vs group assessment test statistic
Categorical, n (%)				
Gender				$\chi^2_1 = 1.350$, $P = 0.245$
Male	62 (32)	37 (35.6)	25 (27.8)	
Female	132 (68)	67 (64.4)	65 (72.2)	
Work status†				$\chi^2_8 = 8.823$, $P = 0.361$
Unemployed	1 (.5)	1 (1)	0 (0)	
Part-time	23 (11.9)	14 (13.5)	9 (10)	
Full-time	18 (9.3)	14 (13.5)	4 (4.4)	
Home duties	21 (10.8)	10 (9.6)	11 (12.2)	
Retired	31 (16)	16 (15.4)	15 (16.7)	
Unemployed due to pain	66 (34)	38 (36.5)	28 (31.1)	
Student	7 (3.6)	2 (1.9)	5 (5.6)	
Voluntary work	4 (2.1)	2 (1.9)	2 (2.2)	
Unemployed—other	6 (3.1)	2 (1.9)	4 (4.4)	
Retraining	0 (0)	0 (0)	0 (0)	
Compensation status†				$\chi^2_3 = 2.944$, $P = 0.457$
None	163 (84.5)	85 (81.7)	78 (86.7)	
Workers compensation	22 (11.3)	14 (13.5)	8 (8.9)	
Motor vehicle crash	3 (1.5)	2 (1.9)	1 (1.1)	
Public liability	2 (1)	2 (1.9)	0 (0)	
Pain duration				$\chi^2_5 = 4.479$, $P = 0.483$
< 6 months	8 (4.1)	4 (3.8)	4 (4.4)	
6–12 months	13 (6.7)	9 (8.7)	4 (4.4)	
1–3 years	42 (21.6)	21 (20.2)	21 (23.3)	
3–5 years	25 (12.9)	15 (14.4)	10 (11.1)	

(continued)

Table A4 Continued

Variable	Total sample ($N = 194$)	Individual assessment (n = 104)	Group assessment (n = 90)	Individual vs group assessment test statistic
5–10 years	34 (17.5)	14 (13.5)	20 (22.2)	
>10 years	66 (34.0)	38 (36.5)	28 (31.1)	
Pain location†				$\chi 10 = 16.235$, $P = 0.085$
Head/face/mouth	11 (5.7)	7 (6.7)	4 (4.4)	
Neck	17 (8.8)	13 (12.5)	4 (4.4)	
Upper limbs	22 (11.3)	7 (6.7)	15 (16.7)	
Thoracic	9 (4.6)	6 (5.8)	3 (3.3)	
Lower back	39 (20.1)	19 (18.3)	20 (22.2)	
Abdominal	5 (2.6)	1 (1)	4 (4.4)	
Genital/anal	5 (2.6)	3 (2.9)	2 (2.2)	
Pelvis/hips	9 (4.6)	3 (2.9)	6 (6.7)	
Lower limbs	18 (9.3)	8 (7.7)	10 (11.1)	
Lower back + limbs	35 (18)	23 (22.1)	12 (13.3)	
Total body pain	16 (8.2)	10 (9.6)	6 (6.7)	
Opioid use				$\chi^2_1 = 1.842$, $P = 0.175$
No	65 (33.5)	30 (28.8)	35 (38.9)	
Yes	122 (62.9)	69 (66.3)	53 (58.9)	
Continuous mean (SD)				
Age				
Mean*	49.18 (11.94)	47.82 (12.14)	50.72 (11.59)	$z = -1.489$, $P = 0.137$
Range	20–72	20–71	20–72	
Outcome measures				
K10	30.03 (9.13)	30.60 (9.00)	29.37 (9.29)	$t(168) = .880$, $P = 0.380$
PSEQ	21.89 (11.67)	21.28 (11.79)	22.59 (11.56)	$t(181) = -.758$, $P = 0.449$
BPI interference*	7.31 (1.78)	7.40 (1.58)	7.20 (1.98)	$z = -1.191$, $P = 0.849$
BPI severity	6.65 (1.41)	6.68 (7)	6.61 (1.50)	$t(183) = .356$, $P = 0.722$
Health care utilization				
GP visits*	4.90 (3.54)	5.09 (3.44)	4.68 (3.67)	$z = -.899$, $P = 0.368$
Specialist visits*	1.10 (1.61)	1.24 (1.70)	.94 (1.50)	$z = -1.181$, $P = 0.237$
Other health professionals*	2.97 (4.80)	3.40 (5.50)	2.46 (3.80)	$z = -1.133$, $P = 0.257$
Daily morphine* (mg)	50.46 (77.73)	53.61 (71.44)	47.05 (84.30)	$z = -1.489$, $P = 0.137$
Number of pain sites*	4.97 (3.079)	5.08 (3.20)	4.85 (2.95)	$z = -.346$, $P = 0.730$

K10 = kessler psychological distress Scale-10; PSEQ = pain self-efficacy questionnaire; BPI = brief pain inventory; GP = general practitioner.

*The non-parametric equivalent, Wilcoxon test used as the distribution of this variable was statically skewed.

†Monte-Carlo used as assumptions of the Chi Square were violated.