People seeking treatment for a new episode of neck pain typically have rapid improvement in symptoms: an observational study

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Question: What is the clinical course of a new episode of non-specific neck pain in people who are treated with multimodal physical therapies in a primary care setting? **Design:** Observational study with 3-month follow-up, run in conjunction with a randomised trial. **Participants:** 181 adults who consulted a physiotherapist or chiropractor for a new episode of non-specific neck pain. **Outcome measures:** Time to recover from the episode of neck pain, time to recover normal activity, and pain and neck-related disability at three months. Clinical and demographic characteristics were investigated as potential predictors of recovery. **Results:** Within 3 months, 53% of participants reported complete recovery from the episode of neck pain. On a scale from 0 (none) to 10 (worst), pain improved from 6.1 (SD 2.0) at baseline to 2.5 (SD 2.1) at 2 weeks and to 1.5 (SD 1.8) at 3 months. On a scale from 0 (none) to 50 (worst), disability improved from 15.5 (SD 7.4) at baseline to 5.4 (SD 6.4) at 3 months. Faster recovery was independently associated with better self-rated general health, shorter duration of symptoms, being a smoker, and absence of concomitant upper back pain or headache. Higher disability at 3 months was independently associated with higher disability at baseline, concomitant upper or lower back pain, older age, and previous sick leave for neck pain. **Conclusion:** People who seek physical treatments for a new episode of neck pain in this primary care setting typically have high pain scores that improve rapidly after commencing treatment. Although almost half of those who seek treatment do not recover completely within three months, residual pain and disability in this group is relatively low. Physiotherapists should reassure people with a new episode of neck pain that rapid improvement in symptoms is common, modifying this advice where applicable based on risk factors. **Trial registration:** ANZCTRN12606000417583. **[Leaver AM, Maher CG, McAuley JH, Jull G, Latimer J, Refshauge KM (2013) People seeking treatment for a new episode of neck pain typically have rapid improvement in symptoms: an observational study. *Journal of Physiotherapy* 59: 31–37]**

Key words: Prognosis, Neck Pain, Rehabilitation, Physical Therapy Modalities, Risk Factors

Introduction

Neck pain affects up to two-thirds of the population at some stage in their lifetime (Cote et al 1998) and is a common reason for seeking health care. A recent systematic review reported that although a new episode of neck pain appears to improve substantially during the acute phase, the prognosis for complete recovery is quite poor (Hush et al 2011). Other systematic reviews have estimated that 50–85% of people with neck pain, when followed up for 1 to 5 years after the initial complaint, did not experience complete recovery (Carroll et al 2008). Few high quality studies of the clinical course of neck pain have been published, and understanding of factors associated with prognosis is limited (Borghouts et al 1998, Carroll et al 2008).

Knowledge about the course of a new episode of neck pain is important to clinicians and their patients. Current practice guidelines emphasise the role of informing and reassuring patients with benign spinal pain about the anticipated course of the condition (Childs et al 2008, NHMRC 2004, Scholten-Peeters et al 2002). This information is important in shaping patients' expectations about recovery and can help in addressing associated fear or anxiety. Additionally, understanding the clinical course of a condition can help assessment of individual patient outcomes by providing a meaningful point of reference with which to compare an individual patient's progress.

It is also important to be able to distinguish those with neck pain who will improve rapidly from those who will develop persisting pain and disability. Neck pain is commonly managed in a primary care setting by physiotherapists and chiropractors. Despite this there is limited knowledge about the prognosis of neck pain in these settings. There is evidence that multimodal treatments consisting of manual therapy and exercise, as provided by these practitioners, are effective in reducing neck pain in the short term (Hurwitz et al 2008, Leaver et al 2010b). Identification of factors associated with recovery in patients receiving multimodal treatment might better inform treatment selection, as well as assist with identification of those patients who might be unsuitable for these treatments.

What is already known on this topic: Neck pain is a common condition and a substantial proportion of those who develop a new episode of neck pain experience persisting or recurrent symptoms.

What this study adds: This study provides a more detailed report on the early clinical course of a new episode of neck pain in people who seek physiotherapy or chiropractic care. The clinical course of neck pain in this group is more positive than previous studies would suggest. On average, improvement in symptoms and functional limitation is rapid and persisting levels of pain and disability at three months are relatively low.

The research questions were:

1. What is the clinical course of a new episode of non-specific neck pain in patients who are treated with multimodal physical therapies in a primary care setting?
2. Are there demographic or clinical factors that are associated with faster rates of recovery from a new episode of neck pain?

Method

Design

An observational study was conducted within the framework of a randomised trial (Leaver et al 2010a). The trial compared the effectiveness of two manual therapy interventions for a new episode of non-specific neck pain and demonstrated no difference in recovery rates or disability outcomes between these interventions. The trial participants were therefore considered to be a representative cohort for this observational study, which investigated the clinical course of patients treated with manual therapy for a new episode of non-specific neck pain.

Participants, therapists, centres

Participants were recruited from physiotherapy and chiropractic clinics in Sydney, Australia. Consecutive patients aged between 18 and 70 years with a new episode of non-specific neck pain were included. A new episode of neck pain was defined as pain in the region between the superior nuchal line and the first thoracic spinous process (Merskey and Bogduk 1994) that was of less than 3 months duration and was preceded by at least one month without neck pain. Patients were excluded if they had neck pain related to a motor vehicle accident or other significant trauma, a primary complaint of arm pain, signs of specific or serious pathology (eg, malignancy, infection, inflammatory disorder or fracture, radiculopathy or myelopathy), a history of neck surgery, neck pain severity less than 2 on a numerical rating scale from 0 (none) to 10 (worst) pain, or were not literate in English. Participants were also excluded if the treating practitioner deemed them unsuitable for manipulative manual therapy, because this was an exclusion criterion for the concurrent randomised trial.

Participants received multimodal physical therapies at four treatment sessions over two weeks. All participants were treated with manual therapy in the form of either high velocity thrust manipulation or mobilisation, according to group allocation in the concurrent randomised trial. The selection of individual manipulation or mobilisation techniques was otherwise at the discretion of the treating practitioner. In addition participants received multimodal physical interventions such as exercise, advice about activity, and electrophysical agents, which were applied pragmatically according to the judgement of the treating practitioner. The practitioners in this study were experienced physiotherapists and chiropractors.

Procedures

Participants completed baseline questionnaires at their initial appointment. Outcome data were collected over a 3-month period using standardised diaries. The diaries included a daily measure of pain on a numerical rating scale from 0 (none) to 10 (worst). Activity interference was also recorded in the diaries daily using Item 5 from the 12-Item Short-Form Health Survey (Ware et al 1996), a 5-point scale anchored by 'not at all' through to 'extreme interference'. To ensure completeness of follow-up, data from the diaries were collected by telephone interview at weekly intervals for the first four weeks, then monthly or until recovery for the subsequent eight weeks (84 days in total). At three months, a telephone exit interview was conducted at which the Neck Disability Index (Vernon and Mior 1991) was administered and pain scores were collected.

Outcome measures

Primary outcome: The primary outcome was the time taken from commencement of treatment to recovery from the episode of neck pain. The day of recovery from the episode of neck pain was defined as the first day of seven consecutive days on which the patient rated the intensity of their average daily neck pain as < 1 on the numerical rating scale from 0 to 10.

Secondary outcomes: Secondary outcomes included time to recovery of normal activity as well as pain (numerical rating scale 0–10) and disability (Neck Disability Index scale 0–50) scores at three months. Time to recovery of normal activity was defined as the first day of seven consecutive days in which the participant rated the degree of interference 'not at all'.

Prognostic factors

We examined 22 putative prognostic factors. Eight demographic variables were examined: age, gender, level of education, employment status, change of employment status due to neck pain, smoking habit, whether a compensation claim for neck pain had been lodged, and self-rated general health. Level of education was determined using items from the Australian Census 2001 (Trewin 2000). Employment status was determined using categories described by Kenny et al (2000). Self-rated general health was measured using Item 1 of the 12-Item Short-Form Health Survey (SF-12). The 14 clinical variables examined were: pain intensity on the 0–10 numerical rating scale, duration of neck pain, disability measured by the Neck Disability Index from 0 (none) to 50 (worst), the physical (PCS) and mental health (MCS) component summary scales of the SF-12, presence of concomitant symptoms (upper limb pain, headache, upper back pain, lower back pain, dizziness and nausea), past history of neck pain, previous sick leave for neck pain, and use of analgesics.

Data analysis

The clinical course of the episode of neck pain was described using Kaplan-Meier survival curves and using descriptive statistics. Prognostic factors were evaluated using separate prognostic models for recovery from the episode of neck pain and disability at 3 months. The first stage involved examination of the univariate relationship between the outcome and each prognostic variable, using Cox regression (for time to recovery), and linear regression (for disability at 3 months). Variables with significant associations ($p < 0.1$) were selected for inclusion in the multivariate analysis. This level of significance was chosen to decrease the likelihood of overlooking potential prognostic factors. Where there was a moderate or strong correlation (Pearson's $r > 0.4$) between individual predictor variables, the variable with the best psychometric properties or ease of clinical application was selected. The selected predictor variables were assessed using multivariate stepwise regression to identify the independent prognostic variables.

Results

Flow of participants through the study

One hundred and eighty-one participants were recruited between October 2006 and June 2008 from 11 primary care clinics in Sydney, Australia. Seven physiotherapists recruited 125 participants and five chiropractors recruited 56 participants. Of the 237 patients screened, 46 did not meet the eligibility criteria and 10 declined to participate.

Compliance with the study method

Three participants did not complete the course of four treatments. All participants completed baseline assessments with no missing data. Five participants withdrew from the study and were censored at the last date of data collection. Completeness of follow-up (Clark et al 2002) was 96% of potential person-time for the time-to-recovery predictive model. Data were included from 176 (97%) participants for the predictive model for disability at 3 months.

Participant characteristics

The baseline demographic and clinical characteristics of the participants are presented in Table 1. The mean age of participants was 38.8 (SD 10.7) years. Pain intensity at baseline was 6.1 (SD 2.0) with the average duration of neck pain 19.5 (SD 20.1) days. The mean disability score was 15.7 (SD 7.4). Neck pain was frequently accompanied by concomitant symptoms, most commonly upper limb pain (n = 144, 80%), headache (n = 117, 65%) and upper back pain (n = 115, 64%). One-hundred and fourteen participants (63%) had a past history of neck pain. Ninety percent of participants rated their general health as 'good' or better, and fewer than 10% were smokers. SF-12 Physical Component Score 43.5 (SD 8.2) and Mental Component Scores 47.3 (SD 10.6) were less than one standard deviation from normal population values.

Table 1. Baseline characteristics of patients with recent onset neck pain and univariate associations with time to recovery from the episode of neck pain and with level of disability at 3 months (n = 181).

Characteristic	Baseline value	Univariate association[a]	
		Time to recovery *p*	Disability at 3 months *p*
Demographic variables			
Age (*yr*), mean (SD)	38.8 (10.7)	0.12	0.02
Gender, n (%) female	117 (65)	0.80	0.05
University degree or higher, n (%)	109 (60)	0.17	0.19
Employed, n (%)	150 (83)	0.48	0.02
Changed work status, n (%)	27 (15)	0.97	0.92
Smoker, n (%)	17 (9)	0.07	0.02
Compensation claim for neck pain, n (%)	4 (2)	0.30	0.36
Self-rated general health, n (%)[b]		0.02	< 0.01
Poor	2 (1)		
Fair	16 (9)		
Good	80 (44)		
Very good	64 (35)		
Excellent	19 (10)		
Clinical variables			
Pain intensity (*0–10*), mean (SD)	6.1 (2.0)	0.29	0.73
Pain duration (*days*), mean (SD)	19.5 (20.1)	< 0.01	0.02
Neck Disability Index (*0–50*), mean (SD)	15.7 (7.4)	0.67	< 0.01
SF-12 PCS (*0–100*), mean (SD)	43.5 (8.2)	0.87	0.02
SF-12 MCS (*0–100*), mean (SD)	47.3 (10.6)	0.01	0.03
Concomitant symptoms, n (%)			
Upper limb	144 (80)	0.01	0.09
Upper back	115 (64)	< 0.01	< 0.01
Lower back	71 (39)	0.01	< 0.01
Headache	117 (65)	< 0.01	0.01
Dizziness	56 (31)	0.02	0.03
Nausea	41 (23)	0.62	0.03
Past history of neck pain	114 (63)	0.16	0.48
Past sick leave for neck pain	57 (31)	0.23	< 0.01
Use of analgesics	30 (17)	0.18	< 0.01

[a]Univariate associations with *p* values < 0.1 were considered statistically significant; [b]Percentages do not add to 100% due to rounding.
SF-12 = 12-item short-form health survey, PCS = physical component summary, MCS = mental component summary

Clinical course of a new episode of neck pain

Ninety-five participants (52%) experienced full recovery from neck pain during the 3-month follow-up period. The median time from commencement of treatment to recovery of pain was 45 days. Of those who recovered, 52 (55%) recovered within 3 weeks and 71 (75%) recovered within 4 weeks of commencing treatment (Figure 1A). The mean pain score for all participants decreased from 6.1 (SD 2.0) at baseline to 2.5 (SD 2.1) after 2 weeks of treatment, and to 1.5 (SD 1.8) at 3-month follow-up (Figure 2). Neck pain intensity in those participants who remained symptomatic (ie, excluding those who had recovered) showed rapid improvement with a mean pain score of 3.1 (SD 1.9) at 2 weeks (n = 143) and a mean pain score of 2.8 (SD 1.6) at 12 weeks (n = 77). The distribution of pain scores at the 3-month follow-up was skewed, with 153 (86%) participants rating residual pain as ≤ 3 out of 10 (Figure 3). The mean pain score at Day 84 obtained from the patient diaries was 1.2 (SD 1.8), which was slightly lower than the pain score obtained at 3-month phone interview follow-up despite these scores being recorded at close time points (Figure 2).

One hundred and twenty participants (66%) reported recovery of normal activity within the 3-month follow-up period. The median number of days to recovery of usual activity was 21 (Figure 1B). The mean Neck Disability Index Score at 3 months was 5.4 (SD 6.4). The distribution of activity interference scores at the 3-month follow-up were skewed, with most participants reporting low levels of interference. The extent of interference was rated 'not at all' by 105 (59%) and 'a little bit' by 58 (33%) participants (Figure 4).

Of the 95 participants who recovered, 21 (22%) reported that they experienced a recurrence of neck pain during the 3-month follow-up period.

Factors associated with faster recovery from a new episode of neck pain

Baseline variables with significant ($p < 0.1$) univariate associations with time to recovery from the episode of neck pain were self-rated general health ($p = 0.02$), duration of neck pain ($p < 0.01$), SF-12 mental component score ($p = 0.01$), upper limb pain ($p = 0.01$), upper back pain ($p < 0.01$), lower back pain ($p = 0.01$), headache ($p < 0.01$), dizziness ($p = 0.02$) and smoking ($p = 0.08$) (Table 1). Correlation among these variables was weak ($r < 0.34$). Five variables remained in the final stage of the multivariate model after stepwise regression analysis. A faster rate of recovery was associated with having better self-rated general health, shorter duration of symptoms, being a smoker, and not having concomitant upper back pain or headache (Table 2).

Factors associated with disability at three months for a new episode of neck pain

Baseline variables with significant univariate associations with higher Neck Disability Index scores at 3 months included age ($p = 0.02$), gender ($p = 0.05$), employment status ($p = 0.02$), smoking ($p = 0.02$), self-rated general health ($p < 0.01$), duration of neck pain ($p = 0.02$), Neck Disability Index ($p < 0.01$), SF-12 physical component score ($p = 0.02$), SF-12 mental component score ($p = 0.03$), upper limb pain ($p = 0.09$), upper back pain ($p < 0.01$), lower back pain ($p < 0.01$), headache ($p = 0.01$), dizziness ($p = 0.03$), nausea ($p = 0.03$), past sick leave for neck pain ($p < 0.01$) and use of medications ($p < 0.01$), as presented in Table 1. There was moderate correlation between the Neck Disability Index and SF-12 physical component scores (Pearson's $r = -0.48$). The Neck Disability Index was considered an easier scale to administer and score in clinical practice and was therefore included in the multivariate analysis. Stepwise regression produced a model describing the association between baseline characteristics and disability at 3 months that accounted for 19% of the variance ($F5, 175 = 9.32$; $p < 0.01$). Five variables remained in the final stage of the multivariate model after stepwise regression analysis. Higher disability at 3 months was associated with higher initial Neck Disability Index score, presence of lower back pain, past history of sick leave for neck pain, age, and presence of upper back pain (Table 2).

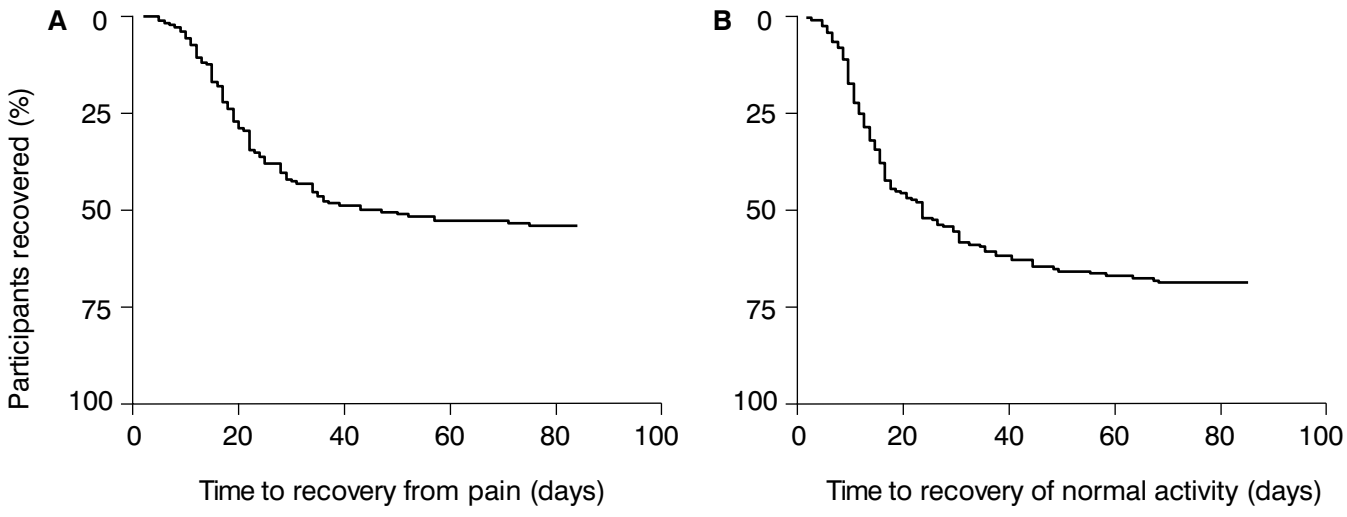

Figure 1. Kaplan-Meier survival curves for recovery from an episode of recent onset non-specific neck pain. (A) Recovery from neck pain. Recovery is defined as the first of seven consecutive days with a pain score of < 1 out of 10. (B) Recovery of normal activity. Recovery is defined as the first of seven consecutive days with an activity interference score of 1 on a scale of 1 (not at all) to 5 (extreme) of activity interference.

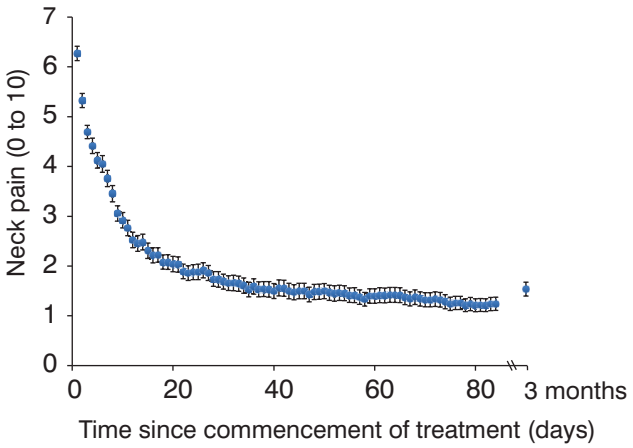

Figure 2. Clinical course of an episode of recent onset neck pain. Mean (SE) daily pain scores (Numerical rating scale 0–10) from baseline to day 84 collected from patient diaries. Data point at far right is the mean pain score at 3 months, which was collected by telephone interview.

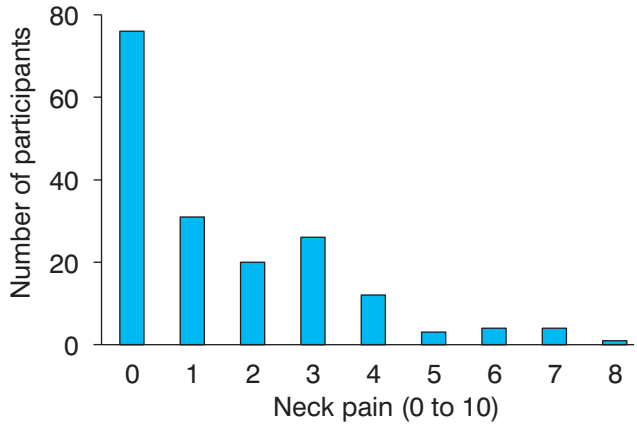

Figure 3. Distribution of neck pain scores at 3-month follow-up (n = 177).

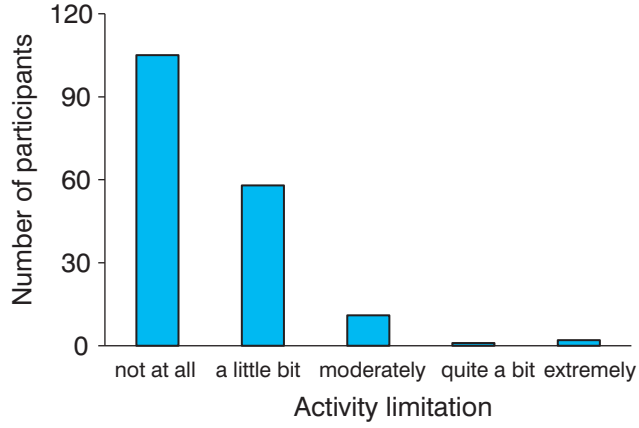

Figure 4. Distribution of activity limitation at 3-month follow-up (n = 177).

Discussion

This study monitored prospectively the clinical course of patients with a new episode of recent onset neck pain and found that the prognosis for a new episode of neck pain might not be as bad as previously thought for patients who seek physiotherapy and chiropractic care. We found that these patients typically presented for care with moderately severe pain and moderate disability. There was rapid improvement in pain and resumption of usual activities within two weeks of commencing treatment. This is substantially earlier than previous descriptions of the timeframe for recovery from an episode of neck pain (Hush et al 2011). Despite this, and consistent with other studies, 46% of those with a new episode of neck pain had not fully recovered at 3-month follow-up. Of those who recovered completely, three-quarters did so within four weeks of commencing treatment. Five factors were identified that were predictive of recovery from an episode of neck pain. Additionally, five factors were identified that were predictive of disability at 3 months.

Practice guidelines recommend that people who seek care for acute musculoskeletal pain should be provided with assurance and information to ensure that they know what

Table 2. Multivariate predictors of time to recovery from the episode of neck pain and of level of disability at 3 months.

Predictor	Time to recovery Hazard ratio (95% CI)	Disability at 3 mo *B* (95% CI)
Smoker[a]	2.04 (1.11 to 3.78)	–
Self-rated general health *(1–5)*[b]	0.75 (0.58 to 0.98)	–
Duration of symptoms *(days)*[b]	0.98 (0.97 to 0.99)	–
Headache[a]	0.56 (0.37 to 0.85)	–
Upper back pain[a]	0.54 (0.36 to 0.81)	2.06 (0.22 to 3.90)
Initial NDI score *(0-50)*[b]	–	0.16 (0.04 to 0.28)
Lower back pain[a]	–	2.58 (0.80 to 4.36)
Past sick leave for neck pain[a]	–	2.84 (0.94 to 4.74)
Age *(years)*[b]	–	0.11 (0.03 to 0.19)

Prognostic effect of predictors for time to recovery from pain (defined as < 1 on a 1–10 numerical rating scale for 7 consecutive days) is expressed with hazard ratios. Prognostic factors for level of disability at 3 months (NDI total score) at any time within a 3-month period is expressed with the regression coefficient *B*. The influence of the variable on disability at 3 months is determined by multiplying the value of the variable by the *B* coefficient. [a]For dichotomous predictors, hazard ratios < 1.0 indicate that the presence of the variable is associated with lower risk of recovery. [b]Risk of recovery for an increase in a continuous predictor of 'x' units is the HR raised to the power of 'x'.

to expect from their condition (NHMRC 2004). This is considered to be an important part of allaying unhelpful expectations, fears, or mistaken beliefs that can negatively influence recovery. Our results might help to better inform patient education and address patient concerns such as *How long will it last?* and *Will it get better?*

Consistent with previous reports of the generally poor prognosis for neck pain (Borghouts et al 1998, Carroll et al 2008, Vos et al 2008), nearly half of the participants in our study had residual symptoms at three months. What is more reassuring for those with a new episode of neck pain is that where recovery does occur, this recovery is rapid, occurring shortly after commencement of treatment. Also reassuring is the pattern of improvement in average neck symptoms that occurred shortly after commencing treatment. On average, neck pain scores were observed to decrease rapidly from a high baseline level to milder levels during a two-week course of treatment. In addition, the majority of those with residual symptoms at three months reported pain of less than 3 out of 10.

Also reassuring for those with a new episode of neck pain was the tendency for disability scores to decrease rapidly after commencing treatment. The average Neck Disability Index score at three months was in the mild range, suggesting that disability resulting from an episode of neck pain is minimal. Although 47% of participants reported persisting neck pain at 3-month follow-up, 92% rated the resulting activity limitation as 'a little bit' or 'not at all'.

The recurrence rate in participants who recovered from the presenting episode of neck pain was quite high and most participants had experienced prior bouts of neck pain. This is consistent with the current view that neck pain is an episodic condition that features intermittent periods of exacerbation and remission (Guzman et al 2008, Vos et al 2008). Because we used different definitions of recovery and recurrence as well as follow-up points that were different from previous studies, direct comparison of recurrence rates with previously described populations is not possible.

Consistent with other studies (Hendriks et al 2005, Hoving et al 2004), the disability measure at baseline was predictive of the disability score at 12 weeks. We did not however, find an association between baseline pain severity and time to recovery. An association between more severe baseline pain and poor prognosis has been demonstrated in cohorts with predominantly chronic neck pain (Bot et al 2005, Hoving et al 2004). This suggests that unlike chronic neck pain, an acute episode (although initially a source of quite severe pain) is likely to resolve rapidly with a short course of treatment. This information might assist in alleviating anxiety and distress in those with severe baseline symptoms.

Concomitant symptoms at baseline were prevalent among people seeking manual therapy care and some of these symptoms were predictive of persisting pain and disability. Our results indicate that the absence of headache and upper back pain were features associated with faster recovery. Conversely, the presence of upper back pain or lower back pain was associated with persisting pain and activity limitation at 3 months. The divergent course of neck pain, depending on the presence or absence of concomitant symptoms, suggests that there is some validity in classifying neck pain syndromes according to symptom distribution. Just as these results demonstrate differing prognoses, it is plausible that subgroups based on distribution of concomitant symptoms might have different aetiologies. These subgroups might also differ with respect to the extent of pathophysiological changes and thus might require different treatment strategies.

Consistent with previous studies, better prognosis was predicted by better self-rated general health and shorter duration of symptoms (Bot et al 2005, Hurwitz et al 2006). Also consistent with previous studies, factors that predicted persisting pain and activity limitation at 3 months included age (Hill et al 2004) and a past history of sick leave (Bot et al 2005, Hill et al 2004). Inexplicably, we found that being a smoker was strongly associated with a more rapid recovery. Given the known adverse health consequences of tobacco smoking (Vineis 2008), it is difficult to imagine the high rate of recovery in the 9% of smokers in this cohort being causally related to smoking. Should this finding appear in other groups with neck pain then further investigation of biological and behavioral factors associated with smoking and the relationship between these factors and neck pain might warrant further investigation. The predictive model for disability at 3 months accounted for just 19% of the variance suggesting that other factors not considered in this study, might influence prognosis. Future investigation of a broader range of biological, psychological and social variables is needed to better understand factors influencing prognosis for neck pain.

The difference between mean pain scores recorded in the participant's diaries at day 84 and those collected by telephone interview at 3 months is intriguing (Figure 2). Due to participant availability there was, on some occasions, delay in conducting the 3-month exit interview. However the stability of the recorded mean pain scores in the preceding 2 months suggests that this would not account for the observed difference. Single-dimension pain scales are probably used by patients to communicate aspects of their pain experience that are more complex than simple pain severity. Recent investigation of commonly used outcome measures for back pain indicates that patients' perceptions of recovery are complex and not necessarily captured by measures such as numerical pain scales (Hush et al 2006). It is also possible that the different modes of data collection, ie, diary entry versus telephone interview, might elicit different responses on a single-item pain scale.

There are some limitations to the generalisability of our study. First, by limiting the setting of this study to manual therapy providers and not including other primary care providers, the results might not generalise to a broader primary care population. In particular, the setting of the study might have introduced a socioeconomic bias. In Australia, consultation with a primary care physiotherapist, chiropractor, or osteopath is not publicly funded, unlike consultation with a medical practitioner. Also, descriptive studies of the profile of chiropractic patients describe a group that is generally healthy and well-educated, with higher than average income (MacLennan et al 2002, Xue et al 2007). Other sociodemographic groups might well be underrepresented in our study. Second, by using data from a randomised trial there is potential for selection bias. All participants in the study received manual therapy treatment, and were excluded if the treating clinician believed that manipulative therapy was not indicated. Conversely, the fact that all participants received pragmatic care based on Australian practice guidelines strengthens the application of these findings to this particular setting.

The results of this study demonstrate rapid and clinically meaningful improvement in neck pain in patients treated with a combination of manual therapy and pragmatic guideline-based care. A randomised trial with a convincing sham control would be needed to establish whether this improvement was due to the treatment provided or to natural recovery. Recovery was more rapid in patients with shorter duration of neck pain, in those without concomitant upper back pain or headache, and in those with better self-rated general health. Older patients, those with back pain, and those who had previously taken sick leave for neck pain were more likely to report activity due to neck pain at the 3-month follow-up. ■

Ethics: The University of Sydney Human Research Ethics Committee(s) approved this study. All participants gave written informed consent before data collection began.

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