

Patterns of prescription and concern about opioid analgesics for chronic non-malignant pain in general practice

Lance M. McCracken, Sophie C. Velleman and Christopher Eccleston Pain Management Unit, Royal National Hospital for Rheumatic Diseases and The University of Bath, Bath, UK

Aim: The purpose of this study was to investigate the circumstances of opioid prescription among general practitioners (GPs) in the UK. **Background:** Prescription of opioids for chronic pain, particularly non-malignant chronic pain, remains controversial. In the midst of this controversy, patterns of actual prescription and influences on these patterns are not well understood. **Method:** A mail survey was posted to 1192 GPs and it was returned by 414 (35.0%). The survey addressed the frequency and reluctance in GP prescription of opioids for chronic pain. It also sampled their attitudes and concerns about opioids, including their views on appropriateness and effectiveness, adverse effects and potential social pressures presumed to impact on prescribing. **Findings:** Overall, 57.9% of GPs reported they sometimes, frequently, or always, prescribe strong opioids for chronic pain, which was of significantly lower frequency than for prescribing of weak opioids, non-steroidal anti-inflammatory drugs (NSAIDs) or tricyclic anti-depressant medications. Similarly, 69.1% reported a reluctance to prescribe strong opioids for chronic non-malignant pain, which was a significantly greater reluctance than for cancer pain, for example. GPs who were men, younger, had fewer years experience and worked full time (as opposed to part time), were more likely to prescribe opioids. Practice guideline use was unrelated to prescribing but those with specialty training were more likely to prescribe. Interestingly, a majority of GPs (83.0%) felt that opioids are effective for chronic non-malignant pain; however, they worry about long-term commitment (such as managing dosing and repeat prescriptions), addiction and other adverse events. **Conclusions:** Based on multivariate analyses, both frequency of prescribing and reluctance were predicted by a combination of concerns about effects on patient behaviour, professional competency concerns and degree of belief in opioids as an effective option. These results may suggest a need for additional GP training in the management of analgesics for chronic non-malignant pain.

Keywords: analgesics; chronic pain; general practice; opioids; prescribing practices

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Introduction

Chronic non-malignant pain represents a widespread and challenging health and social problem

Address for correspondence: Lance M. McCracken, Pain Management Unit, Royal National Hospital for Rheumatic Diseases, Bath BA1 1RL, UK. Email: Lance.McCracken@RNHRD-tr.swest.nhs.uk

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for general practitioners (GPs) working in the community (eg, Gureje *et al.*, 2001; Breivik *et al.*, 2006). Chronic pain is common, with UK prevalence data estimated as high as 46.5% (Elliot *et al.*, 1999), and associated direct health care costs are high (eg, Maniadakis and Gray, 2000). The impact of chronic pain on the individual is a function of numerous variables including the degree of impairment in daily activities (Gureje

et al., 2001) and, not surprisingly, the severity of the pain itself (Smith *et al.*, 2004), which sufferers and their GPs seek to reduce.

In most European countries, including the UK, GPs are the health care professionals most frequently consulted for chronic pain, and prescription medications are the single most frequently utilized treatment approach, used at one time or the other by 79.0% of sufferers (Woolf *et al.*, 2004; Breivik *et al.*, 2006). Estimates suggest that in the UK weak opioids are used by 50.0% of those with chronic pain, non-steroidal anti-inflammatory drugs (NSAIDs) by 23.0% and strong opioids by 12.0% (Breivik *et al.*, 2006). Those who seek medical help have significantly poorer quality of life (Woolf *et al.*, 2004) and are therefore at most risk for continuing poor health over time (Elliot *et al.*, 2002). Despite use of medications, 68.0% of chronic pain sufferers in the UK say there are times when pain is not adequately controlled (Breivik *et al.*, 2006), and the quality of long-term pain relief is generally poor (Elliot *et al.*, 2002). Stannard and Johnson (2003) found that GPs agreed with this generally unfavourable assessment of chronic pain management.

Previous study shows that patients with chronic non-malignant pain are significantly concerned about the opioid and other analgesic medications they use, including worries about addiction, side effects, tolerance and social pressures against medication use, and that these concerns significantly predict their adherence to their physician's prescriptions (McCracken *et al.*, 2006). We know that GPs share many of the same concerns held by patients (Woolf *et al.*, 2004; Ponte and Johnson-Tribino, 2005; Upshur *et al.*, 2006), but we do not know whether these concerns affect the physicians' prescriptions of analgesics for chronic non-malignant pain.

A recent study of 115 GPs from southeast England showed that 25% had not prescribed opioids for persistent non-cancer pain (Hutchinson *et al.*, 2007). This study also examined GPs' beliefs about appropriate uses and risks of opioids. Compared with those GPs who prescribed opioids for non-cancer pain, non-prescribers were older, had been practicing longer and were more likely to agree with the statement that opioids are inappropriate for non-cancer pain. As much as this study was important and was in an under researched area, it was also limited in the fact that it

involved dichotomizing opioids prescription and only examined a small number of GPs' perceptions of risks, namely addiction and tolerance.

The purpose of the present study was to examine GPs' self-reported prescription patterns for chronic non-malignant pain and to identify potential influences on these patterns in their background characteristics, their training, features of their practice setting, the nature of the pain condition under treatment, concerns about adverse effects and other social pressures for or against prescribing. Unlike the earlier study, in the present study opioid prescribing was examined along a more sensitive frequency scale, a wider range of concerns was included and the sample was larger. As strong opioids appear to be both frequently prescribed and potentially controversial, we focus particularly on this class of medication.

Method

Participants

Using standard mail survey methods questionnaires were sent to 1192 GPs in 10 primary care trusts throughout South West England. This list represented the complete list of GPs in the 10 primary care trusts immediately contiguous to our centre in Bath, and including urban, rural and mixed practices. Two follow-up reminders were sent out to non-responders. Fully completed questionnaires and consent forms were received from 414, giving an overall response rate of 35.0%. The participants' ages ranged from 28 to 65 years, and 49.8% were women. The study received full approval from the research ethics committees in the relevant regions of the practices surveyed.

The vast majority of GPs obtained their primary medical qualification in the UK, 91.5%, with an additional 5.1% obtaining their qualification from the European Economic area, 1.4% from Africa and 2.0% other. The large majority of the GPs were White, 95.7%, with the remaining describing themselves as Indian, 1.7%, or in other groups, 2.6%. The GPs had spent between 1 and 36 years working in general practice, with a mean of 14.6 years. Just over half of the GPs worked fulltime, 51.2%. Only 21.2% of women reported working full time while 78.8% of men reported doing so, $\chi^2(1, N=406) = 139.4$, $P < 0.001$. Between 1 and 28 GPs worked in each

practice, with a mean of 6.9. Just over half of the practices were urban, 51.7%, with 35.5% classed as mixed and 12.8% classed as rural. The practice list sizes range from 1000 to 35 000, with an average of 9843.

Survey instrument

We designed a 57-item survey instrument to gather data regarding GPs, the situation of their practice, their patterns of prescribing analgesic medications, and their concerns and attitudes about analgesic medications. For their prescribing patterns they were asked how often they prescribe 'strong opioids,' 'weak opioids' and 'NSAIDs' and other drugs for chronic non-malignant pain patients, on a scale including 'always,' 'frequently,' 'sometimes,' 'rarely,' 'never' or 'unsure.' They were also asked how 'reluctant' they were to prescribe opioid analgesics for chronic non-malignant pain, cancer pain and acute pain, using the same scale. The items regarding concerns and attitudes were based on previous qualitative and quantitative work with patient concerns (McCracken *et al.*, 2006) and included beliefs about appropriateness and effectiveness, concerns about adverse effects, and social pressures, which were each rated on a scale from 0, 'never true,' to 5, 'always true.' All survey items were developed through consensus among the members of the research team, including two psychologists with more than 20 years combined clinical experience in chronic pain management and based on an extensive review of

the relevant literature. During the initial phase of the survey each completed form was examined for missing data, or unclear or illogical responses, and for respondent comments that had been elicited in an open format at the end of the survey form. These methods helped to assure item clarity and content validity.

Results

Prescribing patterns

Overall the largest proportion of GPs, 48.1%, reported that they sometimes prescribe strong opioids for chronic non-malignant pain; 39.9% reported rarely, 8.9% frequently, 2.2% never and 1.0% was unsure. Based on Wilcoxon matched pairs signed-rank tests, these frequency ratings differed significantly from the ratings for prescription of weak opioids, $Z = 15.75$, $P < 0.001$, NSAIDs, $Z = 15.01$, $P < 0.001$ and tricyclic antidepressant medications, $Z = 14.54$, $P < 0.001$. The frequency data for prescription of these four medication types are included in Figure 1.

GPs were also asked if they were *reluctant* to prescribe strong opioids in three different conditions, for chronic non-malignant pain, cancer pain and for acute pain. The largest proportion of GPs, 48.8%, reported they were sometimes reluctant to prescribe strong opioids for chronic non-malignant pain; 23.4% reported rarely, 16.7% reported frequently, 7.5% never and 3.6% always reluctant to

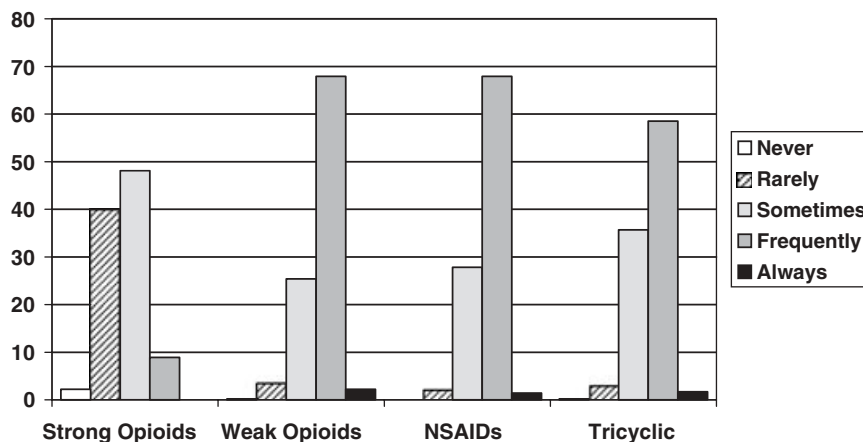


Figure 1 Survey results demonstrating percentages of general practitioners prescribing four common classes of analgesic medications for chronic non-malignant pain ($N = 414$). NSAIDs: non-steroidal anti-inflammatory drugs

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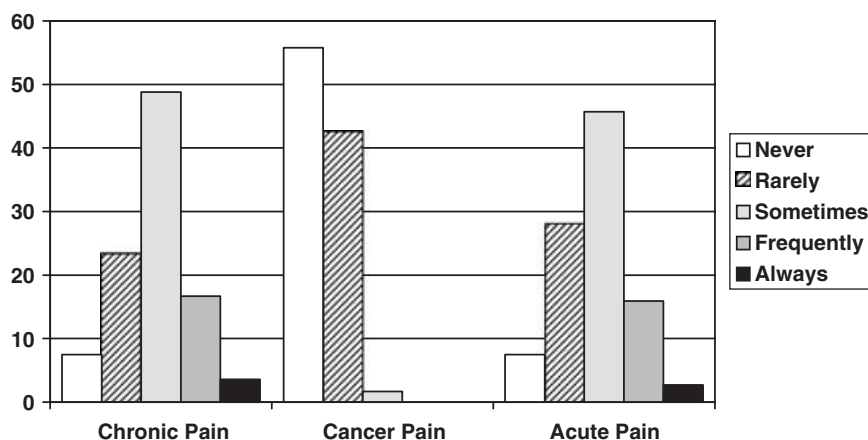


Figure 2 Survey results demonstrating percentage of general practitioners reporting reluctance to prescribe strong opioids for chronic non-malignant pain, cancer pain, and acute pain ($N = 414$)

prescribe. Based on Wilcoxon tests, these reluctance ratings were markedly different to those for cancer pain, $Z = 16.54$, $P < 0.001$, but not different from those for acute pain, $Z = 1.20$, $P = 0.23$. GPs ratings of reluctance to use strong opioids in these conditions are given in Figure 2.

GP and practice characteristics associated with strong opioid prescription for chronic pain

A series of analyses were conducted to examine potential correlates of prescription of strong opioids. For these analyses GPs' ratings of frequency of prescribing and reluctance to prescribe strong opioids were used as the dependent variables. Based on Spearman correlation coefficients both GP age and years in practice were negatively correlated with frequency of prescribing strong opioids, $r_s = -0.10$, $P < 0.05$ and $r_s = -0.11$, $P < 0.05$, respectively. Number of GPs in the practice and approximate patient list size were not correlated with frequency of prescribing. None of these variables were correlated with reluctance to prescribe.

Based on χ^2 analyses, GPs who are men reported more frequently prescribing strong opioids compared with GPs who are women, $\chi^2(4, N = 407) = 15.89$, $P < 0.01$. Women were most likely to report 'rarely' prescribing, 46.7%, compared with men who were most likely to report 'sometimes,' 51.9%, and men were more than twice as likely as women to report 'frequently' prescribing, 12.5% and 5.5%, respectively. GPs

working full time were more likely to prescribe than GPs working part time, $\chi^2(4, N = 413) = 12.50$, $P < 0.05$. Only 10.0% of GPs reported completing some type of speciality training in chronic pain management, including clinical placement, day courses and diploma courses. Those who reported having speciality training were more than twice as likely as those not reporting training to report 'frequently' prescribing opioids, $\chi^2(4, N = 412) = 9.61$, $P < 0.05$.

As a follow-up on the relations between gender, work hours and prescribing, we tested whether the relation with gender was independent of work hours. We found that, in analysis of full-time GPs only, women remained less likely to prescribe; 14.5% men reported 'frequently' compared with 9.5% of women, $\chi^2(4, 208) = 9.9$, $P < 0.05$. In analysis of part-time GPs only, the same result was obtained; for example, 28.6% of men reported 'rarely' compared with 49.4% of women, $\chi^2(4, 198) = 9.9$, $P < 0.05$. Hence, the relationship between gender and prescribing remained, independent of work hours.¹

¹ Because both age and gender were associated with frequency of prescribing, we tested the relationship between age and gender. Women GPs were significantly younger than the men, 42.9 years versus 46.4 years, $t(401) = 4.5$, $P < 0.001$. A subsequent multiple regression analysis was done to examine whether gender remained a significant predictor of prescribing frequency or reluctance to prescribe after statistically controlling for age. Gender remained a significant predictor in both cases, $P < 0.05$.

Over half of the GPs, 56.6%, reported they do not use guidelines to prescribe medications for chronic non-malignant pain. Of those GPs who used guidelines, the most commonly cited was the World Health Organization guideline, 24.1%, followed by the local health authority or practice formulary, 16.7%, and then the British National Formulary guidelines, 13.9%. Also cited was the Bandolier Pain Ladder, 8.3%, the National Institute for Clinical Excellence guidelines, 4.6%, and local hospice guidelines, 4.6%. The question regarding guidelines use included no fixed options for respondents to endorse but used an open response format; so all answers were the GPs' own free reports. The use of practice guidelines was unrelated to frequency of prescribing of strong opioids for chronic pain, $\chi^2(4, N = 412) = 13.60, P = 0.09$. Practice location, rural, urban or mixed, was also unrelated to frequency of prescribing strong opioids, $\chi^2(8, N = 414) = 13.95, P = 0.08$.

As with the frequency of prescribing data, ratings of reluctance to prescribe opioids were related to GP gender, $\chi^2(4, N = 407) = 14.37, P < 0.01$. This result emerged principally because women were twice as likely, compared with men, to report they are 'frequently' reluctant to prescribe opioids, 22.1% and 10.6% respectively. Work hours, part time or full time, was unrelated to reluctance to prescribe opioids, $\chi^2(4, N = 413) = 7.74, P = 0.10$. Those GPs who reported speciality training in chronic pain management were less likely than those without speciality training to feel reluctant to prescribe opioids, $\chi^2(4, N = 412) = 14.29, P < 0.01, 14.6\%$ versus 6.7% 'never' reluctant, respectively. The use of practice guidelines was unrelated to reluctance to prescribe strong opioids, $\chi^2(4, N = 412) = 1.97, P = 0.98$, as was practice location, $\chi^2(4, N = 414) = 11.34, P = 0.18$.

GP attitudes and beliefs

The 15, key, rationally derived attitude and belief items were examined in descriptive and correlational analyses. Again, each of these items was rated on a 0–5 scale, from 'never true' to 'always true.' Summary percentage data are shown in Figure 3. For all of the following descriptive analyses we defined respondents' endorsement of the statement as numerical

responses of 3 or higher on the 0–5 scale, responses corresponding with 'often true,' 'almost always true' or 'always true.' Clearly, the vast majority of GPs believed that opioids are effective for chronic pain, with 83.0% of GPs endorsing this item. They also, in general, felt sufficiently trained in the prescription of opioids to patients with chronic non-malignant pain, 72.6%. A concordant small percentage indicated that they lack confidence in the area of prescribing analgesics, 27.2%. Nonetheless, a significant proportion reported that they worry about the long-term commitment implied by the prescription of opioids for chronic non-malignant pain, 65.9%.

Overall, 37.8% of GPs reported that they worry about harming patients. On the other hand, concerns about patients becoming addicted, experiencing sedation or confusion, or physical dependence, were each reported by more than 60.0% of GPs. Concerns about patients misusing medication, experiencing impaired thinking ability, or diverting opioids for non-clinical use by others, were reported by 44.1%, 35.8% and 23.8%, respectively. GPs reported reluctance to prescribe opioids when a clear diagnosis has not been identified, 68.8%. Only a quarter of GPs reported concerns about having their prescription of opioids negatively scrutinized by professional colleagues, and even a smaller fraction reported they find media coverage of cases of inappropriate opioid use discouraging, 16.9%, or about one in five. Finally, a significant proportion of GPs reported seeing no option but to prescribe opioids for some patients, 57.7%.

Associations between GP attitudes and beliefs, and opioid prescribing

We conducted a series of Spearman correlation analyses to examine the associations between the 15 GP attitudes and concerns examined above and their frequency of prescribing or reluctance to prescribe strong opioid analgesics for chronic non-malignant pain. These results are shown in Table 1.

Nine of the 15 attitude and concern items achieved significant correlations with frequency of prescribing opioids at an α -level corrected for multiple tests, Bonferroni-corrected $\alpha P < 0.003$ ($0.05 \div 15$). The strongest correlate of prescribing was the degree of GP belief that opioids are effective for chronic non-malignant pain, which was a positive correlate. This was followed closely

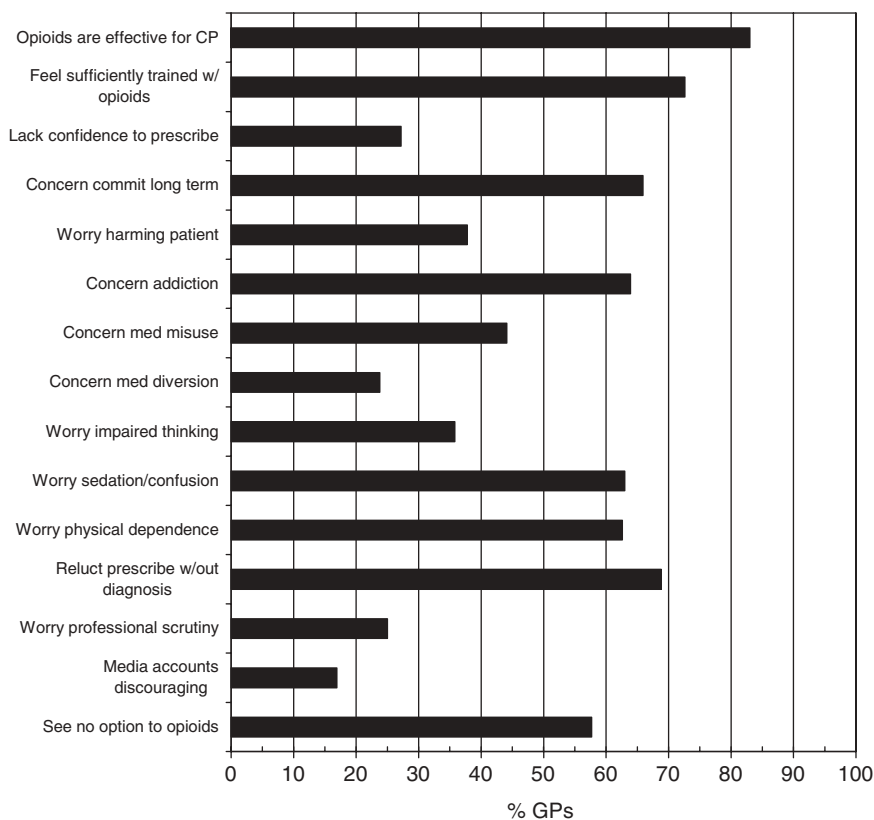


Figure 3 Percentage of general practitioners (GPs) endorsing each survey item regarding attitudes and concerns about strong opioids as ‘often,’ ‘almost always’ or ‘always’ true (*N* = 414)

by concern about addiction and reluctance to prescribe opioids without a diagnosis, and then by concern about long-term commitment and worry about patients becoming physically dependent, which were negative correlates, and feeling sufficiently trained to prescribe opioids, which again was a positive correlate of prescribing. Feeling discouraged about media accounts of medical misuse of opioids, worry about harming the patient and worry about patients experiencing sedation or confusion, were each weak negative correlates of frequency of prescribing, but were significant at a Bonferroni-corrected *P* value.

In general, the correlation results demonstrated that the attitude and concern items were more highly associated with the reluctance ratings than the frequency of prescribing. In fact, the correlations with the reluctance items were roughly twice as large in absolute magnitude on average,

$r = 0.16$ versus 0.31 . Only one of the items failed to reach significance at the Bonferroni-corrected α -level, the item regarding the GPs seeing no option but to prescribe opioids, which had a small negative relationship with the GP’s reluctance ratings. The strongest correlate of reluctance to prescribe opioids was concern about the patient becoming addicted, followed by concern about a long-term commitment with prescribing opioids, and worry about physical dependence. Of course, GPs who reported these concerns to a greater degree were in each case more reluctant to prescribe. Degree of feeling sufficiently trained to prescribe opioids, and belief that opioids are effective for chronic pain were both moderate-sized predictors of reluctance to prescribe. GPs who reported these to a greater degree were less reluctant to prescribe opioids. Reports of worry about harming the patient, concern about

Table 1 Correlations of general practitioners (GPs) attitudes and concerns towards strong opioids for chronic non-malignant pain with the frequency of prescribing and reluctance to prescribe them

GP attitudes and concerns	Correlation results	
	Frequency of prescribing	Reluctance to prescribe
Opioids are effective for chronic pain	0.29**	-0.36**
Feel sufficiently trained with opioids	0.20**	-0.38**
Lack confidence to prescribe	-0.12*	0.28**
Concern about commitment in long term	-0.23**	0.45**
Worry about harming patient	-0.16*	0.32**
Concern about addiction	-0.25**	0.49**
Concern about medication misuse	-0.11*	0.30**
Concern about medication diversion	-0.10	0.21**
Worry about impaired thinking	-0.12*	0.22**
Worry about sedation or confusion	-0.15*	0.22**
Worry about physical dependence	-0.24**	0.45**
Reluctance to prescribe without diagnosis	-0.22**	0.36**
Worry about professional scrutiny	-0.07	0.22**
Discouraged by media accounts	-0.16*	0.29**
See no option	0.14*	-0.12*

* $P < 0.05$; ** $P < 0.001$.

Note: Each of the attitude and concern items are rated on a scale from 0 (never true) to 5 (always true) and the frequency and reluctance items are rated on a six-point scale including 'always,' 'frequently,' 'sometimes,' 'rarely' and 'never.' For the analyses of frequency of prescribing four cases reporting 'unsure' were omitted from the analyses.

medication misuse by the patient, discouragement from media accounts of medical misuse, and lack of confidence in prescribing opioids were each associated with greater reluctance, with the magnitude of correlations suggesting 8–10% overlapping variance with reluctance to prescribe, based on the squared correlation coefficients. Additional results are included in Table 1.

Multivariate prediction of opioid prescribing

For data reduction purposes, we submitted the 15 attitude and concern items to a principal components analyses with an orthogonal rotation. The variable matrix appeared adequately factorable, Kaiser Meyer-Olkin = 0.86, Bartlett's Test of Sphericity approximate χ^2 (df = 105) = 1805.58, $P < 0.001$. A scree plot and eigen values suggested an interpretable four-factor solution that accounted for 61.8% of the variance in the variable set. The factors were labelled as follows: (1) Adverse Behavioural Effects, (2) Professional Concerns, (3) Other Adverse Side Effects and (4) Efficacy Beliefs. Results of the factor analyses are included in Table 2.

Next, the four factors next were used as potential predictors in two hierarchical multiple

regression analyses to generate prediction models for frequency of prescribing strong opioids and reluctance to prescribe strong opioids. In each of these analyses, GP age, gender, hours of work (part time or full time) and years in general practice, were tested first and retained in the equations where significant. The factor scores were then tested after relevant GP background variables were taken into account.

Results of the regression analyses are included in Table 3. The prediction equation for frequency of prescribing accounted for 12.4% of the variance in the criterion variable. Frequency of GP prescribing was a function of work hours, years in practice and the concerns and beliefs included in factors 1, 2 and 4. More frequent prescribing was associated with working full time, fewer years in practice; less concern about adverse behavioural effects, such as misuse and addiction; less professional concern, such as lacking confidence or worry about professional scrutiny; and greater belief in the opioids as the only effective option. Concern over other side effects, such as sedation or confusion, was not a significant predictor of frequency of prescribing in this model.

The prediction equation for reluctance accounted for 38.0% of the variance in the criterion

Table 2 Results from principal components analyses and orthogonal rotation of general practitioners opioids-analgesia-related attitude and beliefs

Attitude and concern items	Factors			
	1	2	3	4
Worry about medication misuse	0.75	0.11	0.22	-0.02
Worry about physical dependence	0.67	0.49	0.27	0.09
Concern about addiction	0.64	0.48	0.13	0.12
Concern about medication diversion	0.64	-0.05	0.21	-0.20
Reluctant prescribe w/out diagnosis	0.62	0.19	0.02	-0.07
Concern commitment in long term	0.53	0.52	0.01	0.21
Feel sufficiently trained with opioids	-0.10	-0.76	0.11	0.30
Lack confidence to prescribe	0.05	0.76	0.08	-0.14
Discouraged by media accounts	0.20	0.66	0.26	0.04
Worry about professional scrutiny	0.34	0.52	0.26	0.10
Worry about sedation or confusion	0.15	0.05	0.87	-0.00
Worry about impaired thinking	0.14	0.10	0.85	-0.02
Worry about harming patient	0.35	0.46	0.58	0.11
Seeing no option but to prescribe	0.13	-0.03	0.05	0.74
Opioids are effective for chronic pain	-0.30	-0.11	-0.05	0.71
% Variance	19.5	19.2	14.3	8.7

The factors from this analysis were labelled as follows: (1) Adverse Behavioural Effects, (2) Professional Concerns, (3) Other Adverse Side Effects and (4) Efficacy Beliefs.

Table 3 Hierarchical multiple regression results from analyses of general practitioners attitude and belief factors as predictors of prescribing and reluctance to prescribe strong opioids for chronic pain

Block predictors	Beta	ΔR^2	Total R^2
Frequency of prescribing opioids			
1) Work hours (full or part time)	0.099	0.021*	
2) Years in general practice	-0.17*	0.023*	
3) Adverse effects on patient behaviour	-0.14*	0.08**	
Professional concerns	-0.19**		
Other adverse side effects	-0.11		
Efficacy beliefs	0.13*		0.12**
Reluctance to prescribe opioids			
1) Gender	0.045	0.041**	
2) Adverse effects on patient behaviour	0.38**	0.34**	
Professional concerns	0.42**		
Other adverse side effects	0.058		
Efficacy beliefs	-0.21**		0.38**

* $P < 0.05$; ** $P < 0.001$.

Note: Age, gender (1 = men, 2 = women), work hours per week (1 = part time, 2 = full time) and years in general practice were tested for entry into the equations in the first step based on statistical criteria ($P < 0.05$ to enter, $P > 0.10$ to remove). The four-factor scores from the general practitioners attitude and belief measure were entered simultaneously as a block after that.

variable. Gender was the only GP background variable related to reluctance, in the direction of women reporting greater reluctance than men. Once again, factors 1, 2 and 4 were significant predictors. Greater reluctance to prescribe

opioids was associated with greater concern over adverse behavioural effects, greater professional concern and less belief in the efficacy of opioids as the only option for chronic pain. Once again, the factor encompassing concerns about other side

effects was not a significant predictor of reluctance to prescribe in this model. Taken together, the GP attitude and concern factors accounted for a moderate amount of variance in this equation, 34.0%.

Discussion

A large sample of UK physicians working in community general practice reported on their patterns of prescribing and attitudes towards prescribing opioid analgesics, particularly for chronic non-malignant pain. These GPs were less likely to prescribe strong opioid analgesics for chronic non-malignant pain than any other class of analgesic medication included; 42.2% reported that they rarely or never prescribe them for this patient group. Multivariate analyses revealed that in explaining the variance in prescription and reluctance to prescribe, concerns over effects on patient behaviour, professional scrutiny and belief in the efficacy of opioids all significantly contributed, regardless of background characteristics of the GPs in the sample. Concerns over other adverse effects of these medicines did not contribute. GPs were much less reluctant to prescribe opioids for cancer-related pain than for non-malignant pain, which may be a part of the same bias against prescribing when the diagnosis for the patient's condition is not clear, as is also shown in the present results.

Clearly, prescribing behaviour is complexly interrelated with prescriber characteristics and situation. The GPs less likely to prescribe opioid analgesics were women and those working part time. Those who reported having undertaken specialty pain management training were more than twice as likely to report 'frequently' prescribing opioids, but there was no relationship between the use of any guideline and reports of prescribing. In further analyses of attitudes to opioid analgesics, GPs clearly endorsed the belief that opioids are effective. As with patient samples, GPs expressed concern over managing prescriptions in the long term. However, in this UK sample, professional and public scrutiny regarding opioid prescriptions was not endorsed as a frequent concern.

We found that GPs often feel that they have no alternatives but to prescribe opioids for chronic

non-malignant pain. This finding could be perceived in a number of ways: that they feel 'trapped' into prescribing opioids specifically; or that they feel that do not know enough about the area to try different treatment options, such as other medications, the possibility of stopping medication altogether, or alternative psychological or rehabilitative methods. This is clinically relevant and suggests that GPs may require further education and training.

The results of this survey are partly consistent with other recent results (eg, Potter *et al.*, 2001; Hutchinson *et al.*, 2007). The study by Hutchinson *et al.* (2007) in the UK found that one-quarter of their sample of GPs prescribed no opioids for chronic pain, and only a small percentage of GPs (11.3%) had training or special interest in chronic pain management. Both of these values are in a similar range to the current results. They also found that GPs of younger age, and with fewer years in practice, were more likely to prescribe. It could be interesting to further study these trends to discover whether they result from training differences, from experiences in practice or from some preconceived prejudices that change over time due to other influences in the wider community or culture. One difference from the earlier results was that they found 52.0% felt that their training was inadequate in relation to pain management, while we found that 72.6% of GPs felt sufficiently trained to prescribe opioids for chronic pain. This apparent difference, however, could be due to differences in how the questions were phrased.

Some of the findings deserve closer investigation. The effects of gender and part-time practice are intriguing. While additional analyses showed that women were far more likely to be working part-time, the relationship between gender and prescribing pattern was independent of work hours. Results from other studies of prescribing patterns have shown no gender differences in opioids prescription in a community clinic setting (Upshur *et al.*, 2006) but have found differences in choices of particular opioids in hospitalized patients (Panda *et al.*, 2004), and, outside of pain management, in preferences for prescribing particular antihypertensive medications (Sequeira *et al.*, 2003). In the current study, the 10% of GPs who had undertaken specialty pain management training reported twice the average prescription

rate and less reluctance to prescribe compared with those who had not been trained. Hence, training and education in pain management does appear to affect practice. However, this increase in prescribing could be due to those GPs who had completed the training being given more complex chronic pain patients. It should also be kept in mind that some physician education programmes, even those that improve physician knowledge and confidence (Cherkin *et al.*, 1991a), for example, may not result in improved patient outcomes (Cherkin *et al.*, 1991b). And finally, we found that reported guideline use had no relationship with self-reported practice. This is perhaps not surprising as primary care implementation of practice guidelines, such as from the National Institute for Clinical Excellence (NICE) in the UK, appears generally quite variable (Sheldon *et al.*, 2004; Wathen and Dean, 2004). It is interesting to note that those cited guidelines are rarely for chronic non-malignant pain, and it is perhaps surprising that important guidelines, such as the recommendations made by the British Pain Society on persistent non-malignant pain, were not mentioned.

Physician attitudes and concerns were relatively more correlated with their ratings of reluctance to prescribe than with their actual frequency of prescribing. First, this means that there are likely to be additional important influences on prescribing that were not identified here, and which will await further study. Second, this may mean that GPs, in some cases, proceed with prescribing but do so with considerable reluctance. This may be important to further understand, such as if it leads to 'half-hearted' or conflicted prescription practices, or to doubts or worry on the part of the physician, particularly if these are unwarranted. This also suggests a potential need for GP training.

There are a number of limitations to the findings of this study. First, only 35.0% of the contacted GPs returned the completed questionnaire and consent form. As there is no way in our data to examine differences between those GPs who participated and those who did not, it is difficult to estimate whether this affected the final results or not. This may limit our conclusions regarding the population to which our results apply in ways that we cannot determine without further study. Second, the sample was largely White and UK

trained. Further study in other parts of the UK, where the demographics of both patients and health care professionals differ, will give a fuller picture. Third, this study was UK centric and therefore factors that might affect some of the items (eg, medicines regulatory issues, media interest in opioids misuse, etc.) are specific to local culture. These factors differ radically depending on the health care and judicial systems of countries, even within Northern Europe, and so extrapolating findings internationally should be done cautiously. Fourth, all of the data, both predictors and dependent variables were collected at one point in time, which may have inflated the apparent relationships. Fifth, many of the identified relations between variables are small in magnitude, suggesting that further analysis and investigation will be needed to derive a more complete and practical model for prediction and influence over the GP behaviour patterns examined here. Finally, these data were based on self-reported practice of opioids prescription and, as such, refer to GP judgements about their own prescribing practice. We did not attempt to directly assess actual or future prescribing patterns.

To summarize some directions for future study, several questions are raised in the current results. The reluctance of women GPs to prescribe opioids is interesting and unexplained. The role of specialist training is unclear, particularly whether those patients in the hands of speciality-trained physicians gain better results than those patients not accessing this care. Regional, cultural, ethnic, socio-economic, professional and political influences on prescribing practices remain unclear at this early stage of research. Research is also needed to verify that reports of prescription practices reflect actual prescription practices.

In this study, we took no account of the appropriateness or actual effectiveness of opioid medication prescription for chronic non-malignant pain. Controversy exists on whether there is too much or not enough opioid prescription for patients with chronic pain (Kalso *et al.*, 2004; Eriksen *et al.*, 2006), and on the effectiveness of our current practice standards. What is certain from these findings, taken together, is that there is significant variability in the practice of opioid prescription, and in beliefs and attitudes about opioid prescription, a variability that cannot be, we would argue, in the best interests

of patients. A goal for clinical practice, and, accordingly, for future research, will be to identify patterns of prescription that benefit or harm patients, and to identify the influences on physician behaviour that are likely to bring about these patient benefits or harms.

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