

Characteristics of patients receiving long-term opioid therapy for chronic noncancer pain: a cross-sectional survey of patients attending the Pain Management Centre at Hamilton General Hospital, Hamilton, Ontario

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Abstract

Background: Characteristics of patients receiving long-term opioid therapy (≥ 6 months) for chronic noncancer pain are poorly understood. We conducted a cross-sectional survey of this patient population to explore demographic variables, pain relief, functional improvement, adverse effects and impressions of an educational pamphlet on long-term opioid therapy.

Methods: We invited 260 adult patients presenting to the Pain Management Centre at the Hamilton General Hospital, Hamilton, Ontario, with chronic noncancer pain to complete a 20-item survey. Patients who presented for procedures were not eligible for our study. We used adjusted logistic regression models to explore the association between higher morphine equivalent dose and pain relief, functional improvement, adverse events and employment.

Results: The survey was completed by 170 patients (a response rate of 65.4%). Most respondents (87.6%; 149 out of 170) were receiving long-term opioid therapy, and the median morphine equivalent dose was 180 mg daily (interquartile range 60–501). Most respondents reported at least modest ($> 40\%$) opioid-specific pain relief (74.1%; 106 out of 143) and functional improvement (67.6%; 96 out of 142), and 46.5% (66 out of 142) reported troublesome adverse effects that they attributed to their opioid use. Most patients were receiving disability benefits (68.3%; 99 out of 145) and, among those respondents who were less than 65 years of age (90.3%; 131 out of 145), 10 (7.6%) were working full-time and 14 (10.7%) part-time. In our adjusted analyses, higher morphine equivalent dose was associated with greater self-reported functional improvement (odds ratio [OR] 1.45, 95% confidence interval [CI] 1.07–1.96) but not with pain relief (OR 1.38, 95% CI 1.00–1.89), troublesome adverse effects (OR 0.92, 95% CI 0.70–1.20) or employment (OR 0.80, 95% CI 0.56–1.15).

Interpretation: Most outpatients receiving long-term opioid therapy for chronic noncancer pain at a tertiary care chronic pain clinic reported at least moderate pain relief and functional improvement; however, adverse effects were common and few patients were engaged in competitive employment.

Opioids are commonly and increasingly used for management of chronic noncancer pain, particularly in North America.^{1–4} In Ontario, the number of opioid prescriptions rose from 3.7 to 4.7 million between 2005 and 2008,⁵ and, across Canada, the rate of dispensing high-dose opioid formulations (> 200 mg morphine equivalent dose daily) increased by 23% from 2006 to 2011.⁶ Canada is currently the second largest per capita consumer of opioids in the world, exceeded only by Austria.⁷ Opioids are the most commonly prescribed class of medication in the United States,⁸

and more than 3% of American adults are undergoing opioid therapy for more than 3 months for chronic noncancer pain.⁹

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Despite the common use of long-term opioid therapy for chronic noncancer pain, little is known about the effectiveness of this approach, and only a few studies have captured the perspective of unselected patients. A meta-analysis of randomized controlled trials (RCTs) involving opioid treatment for chronic noncancer pain reported that the average follow-up period was only 5 weeks.¹⁰ Furthermore, chronic noncancer pain has been reported as the primary cause for years lived with disability;¹¹ however, many trials systematically exclude patients in receipt of disability benefits because of concerns that secondary gain will reduce treatment effects.¹²

These limitations preclude confident generalizability of the patient characteristics in trial settings to real-world settings. To determine the characteristics of patients receiving long-term opioid therapy for chronic noncancer pain, we surveyed patients attending the Pain Management Centre at the Hamilton General Hospital in Hamilton, Ontario. Our objective was to explore demographic variables and provide preliminary insights about clinical outcomes among patients undergoing long-term opioid therapy; specifically, pain relief, functional improvement and adverse effects. We also solicited patient impressions of an educational pamphlet regarding long-term opioid therapy.

Methods

We administered a cross-sectional survey to establish the demographic characteristics of patients receiving long-term opioid therapy for chronic noncancer pain, the types of narcotics prescribed and duration of opioid therapy, employment and disability benefit status, and self-reported pain relief, functional improvement and adverse events attributed to opioid therapy. We also explored the concordance between patient-reported opioid use and their clinical records.

We provided a 2-page educational pamphlet titled “Are you thinking about taking opioids (painkillers) for your pain?” (Appendix 1, available at www.cmajo.ca/content/3/3/E324/suppl/DC1) to elicit patient impressions of this material (i.e., was the information helpful, comprehensive and succinct). This pamphlet was developed to provide pertinent information and encourage informed decision-making for patients considering opioid therapy for their chronic pain, and was previously tested among a group of 20 Canadian patients with chronic noncancer pain who were not receiving opioid therapy.¹³ We administered this pamphlet to patients undergoing long-term opioid therapy to acquire insights from those patients with practical experience in using opioids to manage their chronic noncancer pain.

Setting

The Pain Management Centre at the Hamilton General Hospital.

Participants

We approached adult patients (≥ 18 yr of age) who presented to the Pain Management Centre. Patients who were attending for procedures (e.g., nerve blocks) were not approached to

avoid disrupting the operating room schedule. We surveyed all patients who provided verbal informed consent, but we only included patients with chart-confirmed, long-term opioid use (≥ 6 mo) in our analyses.

Questionnaire development

With the assistance of epidemiologists and content experts, and reference to previous literature,^{14,15} we developed a 20-item, English-language questionnaire to examine characteristics of patients receiving long-term opioid therapy for chronic noncancer pain (Appendix 2, available at www.cmajo.ca/content/3/3/E324/suppl/DC1). Our questionnaire framed response options for attitudinal questions with a 5-point Likert scale (strongly agree, agree, undecided, disagree, strongly disagree), because a previous report showed that closed-ended questions resulted in fewer incomplete questionnaires than open-ended formats.¹⁶

We pretested the final questionnaire with 4 patients receiving opioid therapy for chronic noncancer pain and asked them to comment on the clarity and comprehensiveness of the questionnaire, and the time required to complete it. No changes were recommended.

Questionnaire administration

From May 13 to August 14, 2013, 1 of 3 undergraduate students (HM, BM or AM) attended the Pain Management Centre on one of 16 days during which a pain clinic was booked. Students were available at the clinic for 3 full clinic days and 13 half-days. The Pain Management Centre is the only university-affiliated pain clinic in a referral area from the Niagara region to Guelph, Ont., and its surrounding areas, which has a population of over 2.5 million. It is an outpatient pain treatment centre that sees about 13 000 patient visits per year. The faculty includes 7 anesthesiologists and 1 physiatrist.

Each patient who presented to the pain clinic when a student was present was invited to complete our 20-item survey. Patients were informed that the purpose was to collect data on basic demographics, their experiences with opioid use and their impressions of an educational pamphlet regarding opioids for chronic noncancer pain. We also asked patients to report any opioids they were currently prescribed and we confirmed this information, as well as opioid dose and the patient's primary concern, through chart reviews by an anesthesiologist (AZ, AM or EA). Patients were informed that they were under no obligation to complete the survey. For those who consented, the survey was administered on presentation to the clinic and collected immediately. We selected this population because we believed that they represented typical patients attending an urban tertiary care chronic pain clinic. Approval for our survey was granted by the McMaster Research Ethics Board (REB No. 12-698).

Analysis

We generated frequencies for all collected data. Categorical data were reported as proportions, and continuous data as means and SDs if normally distributed and as medians and interquartile ranges (IQRs) if not. The difference between categorical variables was assessed using the Fisher exact test, and normality of continuous data was confirmed with the Sha-

piro–Wilk test. We calculated the morphine equivalent dose for each prescribed opioid by multiplying the quantity times the strength (i.e., milligrams per unit dispensed) times drug-specific conversion factors using an online calculator developed by the Washington State Agency Medical Directors' Group.¹⁷ In 2007, the Washington State Agency Medical Directors' Group recommended that opioid therapy for chronic noncancer pain should not exceed 120 mg morphine equivalent dose daily.¹⁸ In 2010, the *Canadian Guideline for Safe and Effective Use of Opioids for Chronic Non-Cancer Pain* defined the 200 mg morphine equivalent dose as a “watchful” dose.^{19,20} We calculated the proportion of chronic noncancer pain patients receiving long-term opioid therapy that exceeded these thresholds.

The Initiative on Methods, Measurement, and Pain Assessment in Clinical Trials advised that 30%–41% pain relief is likely to be meaningful in patients with chronic noncancer pain.²¹ Therefore, we set a threshold of greater than 40% to indicate moderate pain relief, and we used the same threshold for functional improvement. To examine the association of morphine equivalent dose with pain relief (< 40% v. ≥ 40% relief of pain), functional improvement (< 40% v. ≥ 40% improvement), employment (not employed v. full- or part-time employment) and self-reported adverse events (problematic v. not problematic), we used univariable and multivariable (adjusted for age and level of education) logistic regression analyses. Because of the skewed non-normal distribution of morphine equivalent dose, we log-transformed these data for analysis, and approximation to the normal distribution was confirmed with a Shapiro–Wilk test ($p = 0.43$). We hypothesized, a priori, that higher morphine equivalent dose would be associated with better outcomes and a greater risk of adverse events, that higher education would be associated with better outcomes and less troublesome adverse events, and that older age would be associated with worse outcomes and a greater risk of adverse events. We calculated that we would need at least 30 completed surveys that endorsed the least common outcome category for each dependent variable to ensure that our regression model was reliable (10 respondents for each independent variable considered).²² Our regression model for employment was adjusted only for age and morphine equivalent dose, because only 24 patients were employed. The variance inflation factor for our independent variables was less than 2 for all regression models, which showed that there was no substantial multicollinearity.²³ We explored the association between reporting 40% or more relief of pain or 40% or more improvement in function and employment status among respondents who were less than 65 years of age using the Spearman rank correlation (ρ). All comparisons were 2-tailed, and we set our level of significance at $p < 0.05$. We performed all analyses using PASW Statistics 18 statistical software (SPSS Inc., Quarry Bay, Hong Kong).

Results

We invited 260 patients who attended the Pain Management Centre with chronic noncancer pain to complete our survey;

170 gave informed consent for access to their medical records and provided a completed survey for a (response rate of 65.4%; Figure 1). Of these, 161 respondents reported that they had a prescription for opioids; however, a chart review revealed that only 154 respondents were actually prescribed an opioid.

Most respondents (96.7%, 149 of 154) with a confirmed prescription were receiving long-term opioid therapy (≥ 6 months) and, of these patients, 57.9% had been prescribed opioids for more than 5 years (Table 1). A chart review of the 149 patients engaged in long-term opioid use showed that 26 patients failed to report a confirmed prescription for opioids, 30 reported receiving an opioid that they were not and 23 reported use of a drug they mistakenly believed was an opioid (e.g., gabapentin) (Table 2). Respondents were only asked to complete the majority of the survey questions if they were receiving long-term opioid therapy, and 2 patients who falsely believed that they were not prescribed any opioids did not complete most of the survey and were excluded from subsequent analyses.

Most patients prescribed long-term opioid therapy were female (62.1%) with a mean age of 53 (SD 13) years (Table 1). Opioid dose among patients was not normally distributed (Shapiro–Wilk test, $p < 0.01$), and the median morphine equivalent dose was 180 mg daily (IQR 60–501). The majority of respondents (64.3%) exceeded the threshold of 120 mg morphine equivalent dose daily that was recommended by the

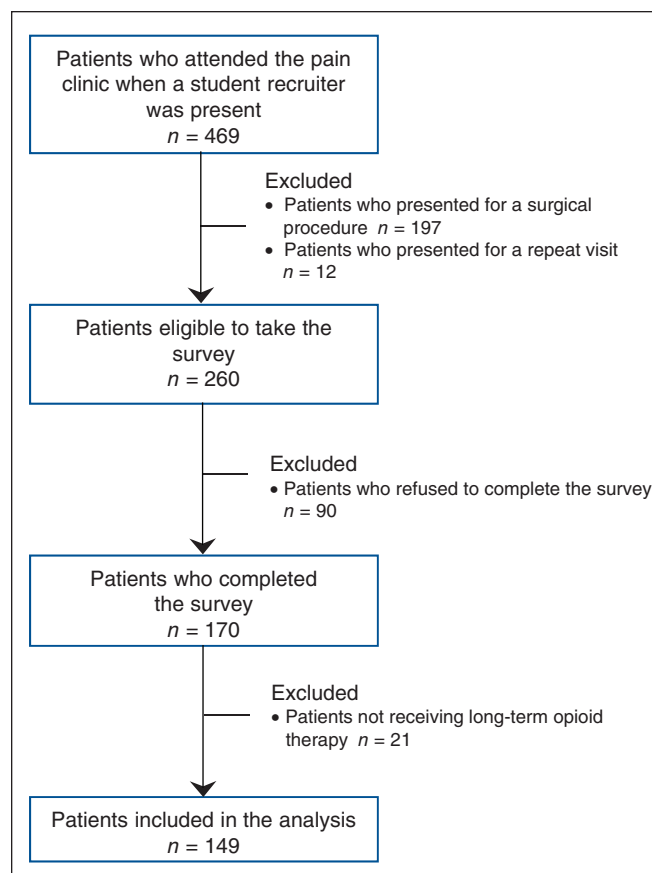


Figure 1: Flow chart for patient selection.

Washington State Agency Medical Directors' Group,¹⁸ and 46.8% of respondents exceeded the watchful dose threshold of 200 mg morphine equivalent dose daily suggested by the Canadian opioid guideline.²⁰

Table 1: Participant characteristics (n = 145)*

Characteristic	No. (%) of participants†
Age, yr; mean ± SD	52.5 ± 13.1
Gender	
Female	90 (62.1)
Male	55 (37.9)
Educational level	
High school not completed	26 (17.9)
High school graduate	41 (28.3)
College degree	55 (37.9)
University degree	23 (15.9)
Duration of opioid use	
6 mo to 1 yr	12 (8.3)
1–5 yr	49 (33.8)
> 5–10 yr	44 (30.3)
> 10 yr	40 (27.6)
Opioid use	
Hydromorphone	52 (35.9)
Oxycodone	51 (35.2)
Codeine	17 (11.7)
Fentanyl	16 (11.0)
Methadone	16 (11.0)
Morphine	16 (11.0)
Tramadol	8 (5.5)
Daily morphine equivalent dose, mg; median (IQR)	180 (60–501)
Presenting clinical condition‡	
Chronic low back pain	94 (64.8)
Chronic neck pain	46 (31.7)
Fibromyalgia	30 (20.7)
Chronic headaches	26 (17.9)
Rheumatoid arthritis	21 (14.5)
Diabetic neuropathy	12 (8.3)
Chronic whiplash	7 (4.8)
Currently receiving disability (wage replacement) benefits	
Yes	99 (68.3)
No	46 (31.7)

Note: IQR = interquartile range, SD = standard deviation.
 *Four patients provided incomplete information for 1 or more of the table items, and we restricted our analyses to those patients (n = 145) who provided complete information.
 †Unless otherwise specified.
 ‡The total is greater than 145 because patients were allowed to endorse more than 1 response option.

The most common condition for which long-term opioid therapy was prescribed was chronic low-back pain (64.8% of patients) (Table 1). Most participants were receiving disability benefits (68.3%) and, among those who were less than 65 years of age, only 7.6% were working full-time and 10.7% were working part-time hours (Table 1, Table 3). Pain relief was reported more often than functional improvement: 74.1% reported more than 40% relief of pain and 67.6% reported more than 40% improvement in function ($p < 0.01$). Problematic adverse effects associated with opioid use were reported by 46.5% of respondents (Table 3). In an analysis adjusted for age and level of education, a higher morphine equivalent dose was associated with significantly greater self-reported functional improvement (odds ratio [OR] 1.45, 95% confidence interval [CI] 1.07–1.96) but not significantly with pain relief (OR 1.38, 95% CI 1.00–1.89), troublesome adverse effects (OR 0.92, 0.70–1.20) or employment (OR 0.80, 95% CI 0.56–1.15) (Appendix 3, available at www.cmaj.ca/content/3/3/E324/suppl/DC1). Older age was significantly associated with reporting greater functional improvement (OR 1.46, 95% CI 1.05–2.04) and reduced odds of employment (OR 0.59, 95% CI 0.36–0.97) (Appendix 3). We found no association between higher self-reported pain relief and employment ($\rho = -0.05$, $p = 0.6$) or between higher self-reported functional improvement and employment ($\rho < 0.01$, $p = 1.0$).

Seventy-five percent of respondents reported that they were already aware of the information provided in the educational pamphlet. After reading the pamphlet, 7.1% indicated that they were considering stopping opioid therapy and 5.6% reported that they would have decided against long-term opioid therapy if they had read the pamphlet when the option to pursue opioid therapy was suggested. Most respondents felt the pamphlet material was helpful and easy to understand (Table 4).

Discussion

Main findings

Many of the patients receiving long-term opioid therapy who attended the Pain Management Centre exceeded the guideline recommendations for the maximum daily morphine equivalent dose or watchful dose. Most patients reported moderate improvements in pain and function; however, troublesome adverse effects were common, and few were engaged in competitive employment. Some patients were unaware of which opioids they were prescribed or mistook nonopioid medications for opioids.

Explanation and comparison with other studies

We found that patients receiving long-term opioid therapy were often prescribed high doses. A 10-year (1997–2005) study involving adults enrolled in 2 health plans that served over 1% of the US population²⁴ found that most long-term opioid users received less than a 20 mg morphine equivalent dose daily, which is considerably less than the median of 180 mg morphine equivalent dose daily in our study. However, our sample was a select population of patients attending a chronic pain clinic for chronic noncancer pain. This may be

Table 2: Patient-reported v. confirmed prescriptions for opioids among patients receiving long-term opioid therapy (n = 149)*

Variable	No. (%)						
	Codeine	Oxycodone	Tramadol	Hydromorphone	Methadone	Morphine	Other opioid
Patients with a confirmed prescription	17 (11.4)	51 (34.2)	8 (5.4)	52 (34.9)	16 (10.7)	16 (10.7)	18 (12.1)†
Patients who did not report a confirmed prescription	3 (2.0)	0 (0.0)	3 (2.0)	5 (3.4)	1 (0.7)	4 (2.7)	12 (8.0)†
Patients who reported a prescription that they did not have	6 (4.0)	7 (4.7)	1 (0.7)	10 (6.7)	2 (1.3)	6 (4.0)	26 (17.4)‡

*Total numbers across rows are greater than 149 because some patients were prescribed more than 1 opioid.

†These were fentanyl patches in all cases.

‡Respondents listed the following drugs as opioids: desipramine, nortriptyline, gabapentin, baclofen, lorazepam, nabilone, pregabalin, naproxen and duloxetine.

cause for concern given evidence from observational studies that found that patients with chronic noncancer pain who received high-dose opioid therapy were at greater risk for fractures, road trauma and opioid-related mortality.^{25–29}

We found that most of our respondents reported moderate improvement in both pain relief and functional ability with long-term opioid therapy; however, less than 1 in 5 patients were able to sustain even part-time work, and we found no evidence of an association between self-reported improvement in pain and function and gainful employment. Among our respondents, higher morphine equivalent dose was associated with greater self-reported functional improvement but not pain relief or employment. A subgroup analysis within a recent systematic review of strong versus weaker opioids suggested a benefit of stronger opioids over non-narcotic analgesics in pain relief but not functional restoration.¹⁰ However, this positive result was based on 2 trials with important limitations,³⁰ and the subgroup analysis failed to meet important criteria for credibility.³¹ Older age was paradoxically associated with greater self-reported functional improvement and reduced odds of employment; however, the latter association is well established in the literature.³² There are limited data on the long-term safety and efficacy of the use of opioids for chronic noncancer pain.^{33,34}

Strengths and limitations

Our study has several strengths. Our response rate of 65.4% provides some assurances that our findings are likely representative of chronic noncancer pain patients attending the Pain Management Centre. We pilot-tested our survey among eligible patients before administration, and we independently confirmed all primary concerns and opioid prescriptions through a chart review for all patients.

One limitation of our study is its generalizability because of our focus on a single hospital-based pain clinic; however, the Pain Management Centre has a catchment area that includes over 2.5 million people, which suggests that our findings may be applicable to Canadian patients with chronic noncancer pain who are referred for tertiary pain management. We measured self-reported pain relief and functional

Table 3: Patient-reported impact of long-term opioid therapy

Impact	No. (%) of patients
Degree of pain relief (n = 143)	
< 20%	11 (7.7)
21%–40%	26 (18.2)
41%–60%	49 (34.3)
61%–80%	48 (33.6)
> 81%	9 (6.3)
Degree of functional improvement (n = 142)	
< 20%	14 (9.9)
21%–40%	32 (22.5)
41%–60%	50 (35.2)
61%–80%	38 (26.8)
> 81%	8 (5.6)
Employment status (n = 144)	
Full-time hours, unmodified duties	5 (3.5)
Full-time hours, modified duties	5 (3.5)
Part-time hours, unmodified duties	6 (4.2)
Part-time hours, modified duties	8 (5.6)
Not working	103 (71.5)
Housekeeper/stay-at-home parent	3 (2.1)
Student	1 (0.7)
Retired	13 (9.0)
The adverse effects associated with opioid use are problematic (n = 142)	
Strongly agree	28 (19.7)
Agree	38 (26.8)
Undecided	17 (12.0)
Disagree	33 (23.2)
Strongly disagree	26 (18.3)

Table 4: Patient impressions of the educational pamphlet “Are you thinking about taking opioids (painkillers) for your pain?”

Patient impression	No. (%) of patients				
	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
I was aware of this information before starting on long-term opioid therapy (<i>n</i> = 143)	43 (30.1)	64 (44.8)	18 (12.6)	10 (7.0)	8 (5.6)
This information makes me feel more positively about long-term opioid therapy (<i>n</i> = 143)	25 (17.5)	61 (42.7)	43 (30.1)	13 (9.1)	1 (0.7)
If I had this information before I began long-term opioid therapy, I would have decided against long-term opioid therapy (<i>n</i> = 143)	1 (0.7)	7 (4.9)	23 (16.1)	66 (46.2)	46 (32.2)
Having read this information now, I am thinking about stopping or decreasing my use of opioids (<i>n</i> = 143)	0	10 (7.0)	24 (16.8)	53 (37.1)	56 (39.2)
The pamphlet was too complicated/confusing (<i>n</i> = 142)	1 (0.7)	4 (2.8)	16 (11.3)	66 (46.5)	55 (38.7)
The pamphlet provided too much information (<i>n</i> = 141)	0	6 (4.3)	16 (11.3)	72 (51.1)	47 (33.3)
The pamphlet provided too little information (<i>n</i> = 141)	3 (2.1)	21 (14.9)	19 (13.5)	65 (46.1)	33 (23.4)
Reading the pamphlet answered all my questions about long-term opioid therapy (<i>n</i> = 141)	22 (15.6)	55 (39.0)	38 (27.0)	23 (16.3)	4 (2.1)
Reading the pamphlet reduced my fears about long-term opioid use (<i>n</i> = 141)	12 (8.5)	51 (36.2)	48 (34.0)	24 (17.0)	6 (4.3)
Reading the pamphlet increased my fears about long-term opioid use (<i>n</i> = 141)	0	16 (11.3)	20 (14.2)	73 (51.8)	32 (22.7)

improvement from baseline in a cross-sectional survey, which is subject to recall bias. Although students surveyed patients for mostly half-days, they attended a mix of mornings and afternoons at the clinic, and there was no reason to suspect that their pattern of attendance would result in a selection bias. Furthermore, although we purposely chose nonclinicians to administer all surveys, some patients may have felt obligated to report improvement in pain and function to justify their long-term opioid use. Finally, we asked patients to report whether or not they would consider stopping opioid therapy after reading an educational pamphlet, and it is likely that a limited number of patients would endorse this decision because of cognitive dissonance.

Conclusion and implications for practice and future research

Our survey findings suggest that patients undergoing long-term opioid therapy for chronic noncancer pain can generally anticipate moderate pain relief and functional improvement, but troublesome adverse effects are common and re-engagement with competitive employment is rare. Rigorously conducted RCTs are needed to establish the role of long-term opioid therapy in the management of chronic noncancer pain. Many chronic noncancer pain patients are less than 65 years of age, and trials studying this population should include employment as an outcome measure. Prospective studies enrolling chronic noncancer pain patients at the time they are deciding whether or not to pursue opioid therapy are needed to further explore the impact of the educational pamphlet we administered. We found that many patients with chronic noncancer pain who received long-term

opioid therapy were unclear about what opioids they were prescribed; this suggests that there is a role for greater education about opioids and raises the possibility that some patients are not aware of the benefits and risks of the analgesics they are taking. Formal study of efforts to improve communication and understanding in the area are warranted.

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