

An Observational Study on the Prevalence and Pattern of Opioid Use in 25,479 Patients With Spine and Radicular Pain

Gilbert J. Fanciullo, MD, MS,* Perry A. Ball, MD,† Gisele Girault, MD,*
Robert J. Rose, MD,* Brett Hanscom, MS,‡ and James N. Weinstein, DO, MS‡

Study Design. A cross-sectional analysis of data obtained from patients with spinal and radicular pain and their spine center treating physicians was performed.

Objectives. To identify characteristics of patients treated with opioids that distinguish them from similar patients not treated with opioids in a large population of patients with spine and radicular pain, and to determine the prevalence of opioid use.

Summary of Background Data. The use of opioids with patients who have chronic pain remains controversial. The long-term risks and benefits are poorly described. The efficacy of this treatment has not been proved, yet the large majority of pain specialist physicians manage chronic pain with opioids.

Methods. Descriptive data from the initial visits of 25,479 patients with spinal pain were reviewed. Patients were grouped according to whether or not opioids were recommended, prescribed, or continued. The prevalence of opioid use and patient characteristics were compared using standard statistical tests.

Results. Overall, 3.4% of the patients had opioids included in their plan of care. There was no difference in

age, gender, education, or compensation status between the two groups. Patients were more likely to be treated if the duration of their symptoms had been less than 3 months. However, 75% of the patients with opioids in their plan had experienced symptoms longer than 3 months. A greater incidence of objective findings was identified in the opioid group.

Conclusions. The authors cannot comment on the prevalence of opioid use because, to the best of their knowledge, no other similar studies are available for comparison. [Key words: back pain, epidemiology, opioids, pain, symptoms] **Spine 2002;27:201–205**

The management of pain has attained a high degree of importance in the United States.² Opioids or narcotic analgesics are strongly advocated for patients with cancer and acute pain.^{1,10} The long-term use of opioids for patients with chronic noncancer pain remains controversial.⁵ The studies most often cited to support long-term opioid therapy for chronic noncancer pain examine only a small number of patients at a single site in a nonblinded fashion.^{4,8,11} At best, they suggest a mild decrease in pain without apparent side effects for only a period of weeks. At this writing, the largest survey involves only 112 patients at two sites in a single United States city.⁷ The prevalence of chronic opioid treatment for patients with noncancer pain is unknown.

It has been proposed that chronic opioid therapy for noncancer pain should be considered only by practitioners who thoroughly understand the issues and stand ready to commit the personal resources necessary for the management of these patients.¹² Among the physician members of the American Pain Society, 87% maintain such patients on opioids and support the long-term use of narcotic analgesics for patients with chronic noncancer pain.¹⁵ The aim of this study was to describe the prevalence of opioid use in 25,479 patients with spine and radicular pain. The study also described the characteristics of patients treated with opioids, as compared with patients not so treated, and serves as a baseline for future investigation into both safety and efficacy.

■ Methods

This cross-sectional analysis was based on 25,479 patients seen for spine disorders between 1995 and 1998 at 23 specialty spine care centers across the United States.* Patients who saw participating physicians at these spine centers were asked to complete the National Spine Network (NSN) Health Status

From the *Department of Anesthesiology, the †Section of Neurosurgery, and the ‡Spine Center, Dartmouth-Hitchcock Medical Center, Lebanon, New Hampshire.

Supported in part by the National Spine Network.

*Alegent Health System/Nebraska Spine Surgeons, Omaha, Nebraska; Alliant Health System/Kenton D. Leatherman Spine Center, Louisville, Kentucky; Dartmouth Hitchcock Medical Center, Hanover, New Hampshire; Emory HEALTHCARE/Emory Spine Center, Atlanta, Georgia; Georgetown University Medical Center, Washington DC; Hospital for Joint Diseases Spine Institute, New York, New York; Lakewood Orthopaedics, Denver, Colorado; Medical College of Wisconsin, Milwaukee, Wisconsin; Medical University of South Carolina, Charleston, South Carolina; New England Baptist Hospital, Boston, Massachusetts; North Carolina Spine Center, Chapel Hill, North Carolina; North Kansas City Hospital/Spine and Scoliosis Surgery, Kansas City, Missouri; Rush–Presbyterian/St. Luke’s Medical Center, Chicago, Illinois; University Hospital Spine Institute, Cleveland, Ohio; University of Iowa Hospitals and Clinics, Iowa City, Iowa; University of Missouri Health Sciences Center, Columbia, Missouri; The Hospital for Special Surgery, New York, New York; Thomas Jefferson University Hospital/Rothman Institute, Philadelphia, Pennsylvania; University of California, San Francisco, San Francisco, California; University of Pittsburgh Medical Center/University Orthopaedics, Pittsburgh, Pennsylvania; University of Utah School of Medicine, Salt Lake City, Utah; Washington University School of Medicine/Barnes–Jewish and St. Louis Children’s Hospitals, St. Louis, Missouri; Vanderbilt University Spine Center, Nashville, Tennessee; SUNY Health Science Center, Syracuse, New York; Tulane University Medical Center, New Orleans, Louisiana; William Beaumont Hospital, Detroit, Michigan.

Acknowledgment date: December 13, 2000.

First revision date: April 6, 2001.

Acceptance date: June 5, 2001.

Device status category: 1.

Conflict of interest category: 12.

Survey. Baseline questionnaire data for all the patients elected to participate in the study were included in this analysis.

The NSN Health Status Survey asks patients to report their age, gender, education, marital status, race, height, weight, work status, workers' compensation status, legal action status, location and severity of pain symptoms, duration of spine problems, patient expectations, medication use, comorbid illnesses, and functional health status (as measured by the Medical Outcomes Study 36-Item Short Form (SF-36)). Clinicians complete a second portion of the survey and indicate neurologic signs, dermatomal pain distribution, pain radiation, surgical history, specific diagnosis, diagnostic tests ordered or reviewed, consultations requested, treatments recommended or prescribed, and follow-up plan.

The SF-36 is a 36-item questionnaire measuring eight different health concepts: physical functioning, bodily pain, role limitations resulting from physical health problems, role limitations because of personal or emotional problems, emotional well-being, social functioning, vitality, and general health perceptions.¹⁸ It also includes a single item that provides an indication of perceived change in health.

The SF-36 was developed as part of the Rand Medical Outcomes Study conducted during the 1980s.⁶ Each subscale has a 2-point, 3-point, 5-point, or 6-point scoring system. Each item is converted to a scale of 0 to 100, and items in each subscale are summed and averaged. Thus, the highest score for the SF-36, or for any of its subscales, is 100. Higher scores indicate a more favorable health state. Normative scores for the U.S. general population are available by age and gender.¹⁹ Administration of the SF-36 requires approximately 10 minutes.

Not all physicians at each spine care center participated in the study, and not all patients who saw participating physicians elected to complete the questionnaire. The proportion of patients who chose to participate is not known. Almost 100% of the patients and physicians surveyed at one center, Dartmouth-Hitchcock Medical Center, had completed the survey for all visits. More than 80% of the participating physicians were surgeons, physiatrists, and neurologists.

Patients were grouped according to whether or not the physician recommended, prescribed, or continued an opioid as part of the treatment plan. "Continued" meant that opioids were already part of the treatment plan at the time of the evaluation, and this plan was not altered by the spine care physician. Of the total study population, 867 patients had opioid marked as part of their treatment plan, and 24,612 patients did not. The prevalence of opioid use among NSN physicians was estimated using these figures. Selected demographic characteristics and clinical features of opioid and nonopioid patients were compared.

All comparisons were made using standard statistical tests. Student's *t*-test was used for comparison of continuous measures, and the Pearson χ^2 test was used for comparison of categorical response variables. Statistical significance was based on a *P* value of 0.05. All statistical analyses were performed using STATA release 6.0 (STATA Corporation, College Station, TX).

■ Results

Opioid medications were recommended, prescribed, or continued for 867 patients (3.4%) from a group of 25,479 patients at the time of their initial evaluation in a specialty center for spine pain. There was no difference in

Table 1. Duration of Symptoms in Patients With and Without Opioids as Part of Their Treatment Plan

Symptom Duration	Nonopioid (%)	Opioid (%)
<1 mo	5.0	15.9
1-3 mo	8.6	10.2
3-6 mo	7.4	5.0
6-12 mo	10.0	7.5
1-2 yr	10.7	7.6
2-5 yr	16.4	14.5
>5 yr	41.9	39.2

P < 0.005.

the mean age between patients offered and those not offered opioids (47.5 years *vs* 48; *P* = 0.382), nor was there a difference in gender (52.5% female *vs* 54.9%; *P* = 0.154). There was no difference in level of education (*P* = 0.620), nor was there a difference in the percentage of patients receiving compensation in the two groups (19.9% *vs* 22.4% in the patients not treated with opioids; *P* = 0.103). Fewer patients treated with opioids had hired an attorney (12.4% *vs* 16.6%; *P* < 0.005), and fewer were currently working (41.8% *vs* 46%; *P* = 0.017). There were more cigarette smokers among the patients treated with opioids (22.7% *vs* 16.5%; *P* < 0.005).

Patient-reported duration of symptoms is displayed in Table 1. Patients were more likely to be treated with opioids if the duration of symptoms was less than 3 months than if it was longer. Overall, more than 60% of the patients treated with opioids had experienced symptoms longer than 1 year, and approximately 40% had experienced symptoms longer than 5 years. The patients treated with opioids had a greater incidence of neurologic signs (36.7% *vs* 26.3%; *P* < 0.005), dermatomal pain distribution (60% *vs* 40.7%; *P* < 0.005), and radiation of pain (67.1% *vs* 57.5%; *P* < 0.005). The incidence of previous surgery was similar in the two groups (11.3% in the opioid-treated group *vs* 12.3%; *P* = 0.369).

Patients in the opioid group had a slightly greater incidence of comorbidities overall and a greater incidence of chronic lung disease, malnutrition, obesity, and peripheral vascular disease (Table 2).

Patients in the opioid-treated group were more likely to be taking medications for their spine-related problem (79.3% *vs* 70.5%; *P* < 0.005). Medications were not distinguished in terms of prescription, over-the-counter, dosage, or type. There was no difference in the self-reported effects of medication between the groups, with more than 80% of the patients in both groups reporting a favorable response to medication (Table 3).

Patient diagnosis is shown in Table 4. Patients with a diagnosis of herniated disc, fracture caused by trauma, or acute sprain were more likely to be treated with opioids. Patients with a diagnosis of spinal stenosis, chronic sprain, chronic pain syndrome, idiopathic scoliosis, and spondylolisthesis were less likely to be treated with opioids. Table 5 displays SF-36 results.

Table 2. Comorbidities of Patients Who Did and Did Not Have Opioid as Part of Their Therapeutic Plan

	Nonopioid (%)	Opioid (%)	<i>P</i> Value
No. of comorbidities			<0.005
0	65.4	64.8	
1	23.4	22.8	
2	7.9	7.6	
3	2.4	3.5	
≥4	1.0	1.3	
Specific comorbidities			
COPD	0.7	1.4	0.028
Malnutrition	0.1	0.3	0.006
Obesity	7.7	10.5	0.002
Peripheral vascular disease	0.8	1.5	0.045

COPD = chronic obstructive pulmonary disease.

Discussion

The large sample size of this descriptive study allowed the characteristics of the study population to be depicted more accurately than would a smaller population sample. Because of the large sample size in this study, even quite small differences between groups could achieve statistical significance. Clinical significance, however, could be lacking. All *P* values should be interpreted with this in mind.

Opioids were recommended, prescribed, or continued in 3.4% of the patients seen by physicians providing care at 23 spine centers in the United States. In Germany, 60 of 1389 patients (4.3%) with chronic neuropathic and neuromuscular pain were found suitable for treatment with opioids in 1993.¹⁴ Other German investigators in 1996 found that 4.7% of 1000 patients with chronic pain were suitable candidates for opioid treatment.⁹ These findings are consistent with the data presented in this report. To the best of the authors' knowledge, there are no reports on the prevalence of opioid use among patients with a specific diagnosis or among patients in the United States.

It is not known whether opioids were used acutely or chronically in the study sample, although it is likely that some patients were being treated for acute pain. Acute sprain and fracture accounted for 14.3% of the patients treated with opioids, implying a greater percentage of shorter-duration symptom diagnoses than found in patients not treated with opioids. Nevertheless, more than 75% of the patients treated with opioids had symptoms that had lasted longer than 3 months, and these patients

Table 3. Effects of Opioid and Nonopioid Medication on Reports of Pain

Medication Effect	Nonopioid	Opioid
Better	10.4	10.4
Somewhat better	70.1	70.5
Unaffected	19.0	18.6
Somewhat worse	0.3	0.3
Worse	0.2	0.2

P = 0.997.

Table 4. Most Frequent Diagnoses for Patients Who Have and Do Not Have Opioid as Part of Their Therapeutic Plan (Diagnoses Listed in Decreasing Order of Frequency)

Diagnosis	No Opioid	Opioid
Herniated disc	19.0	28.7
Spinal stenosis	12.8	8.7
Instability	1.2	0.8
Spondylolisthesis	13.5	7.7
Chronic pain syndrome	5.5	4.2
Fracture	2.8	6.5
Acute sprain	3.8	7.8
Chronic sprain	4.6	1.5
Scoliosis	4.2	1.3
Other	32.6	32.8

P = 0.00.

could not be characterized as having acute pain. The prevalence of 3.4% most likely represented a predominance of patients with chronic rather than acute pain. The patients in this group who would be maintained on long-term opioid therapy likely was significantly less than 3.4%. Because there was no follow-up assessment, the number of patients actually treated with opioids is unknown.

Opioids were more likely to be considered as part of the plan for patients with pain that had lasted less than 3 months. However, the overwhelming majority of patients had symptoms that had lasted more than 3 months. The patients with a shorter duration of symptoms may have had acute pain or recurrent acute pain and treatment to some extent with opioids in anticipation of symptoms being alleviated either by natural history or surgery. The decision making involved in prescribing opioids was different for these patients than for most of the patients in this study, who more likely had chronic pain.

There was no correlation between the inclusion of opioids in the treatment plan and any of the following: age, gender, education level, compensation status, or prior surgery. The patients treated with opioids were more likely to smoke cigarettes and less likely to have hired an attorney. They were more likely to be unemployed.

Findings have shown that surgeons, physiatrists, and neurologists are the least likely of physician specialists to

Table 5. Health Status Profile (SF-36) Subscale Scores for Patients With and Without Opioids as Part of Their Treatment Plan

Health Status Profile	Nonopioid	Opioid	<i>P</i> Value
General Health	60.5	61.3	0.349
Physical Functioning	41.1	32.0	0.000
Role Physical	18.6	12.2	0.000
Role Emotional	59.4	58.6	0.631
Social Functioning	50.8	42.2	0.000
Mental Health	63.4	62.8	0.423
Bodily Pain	30.0	22.3	0.000
Vitality	39.8	39.3	0.557

prescribe long-term opioids, and that these specialists comprise the largest number of physicians in NSN centers.¹⁶ It is possible that physicians with a background in family practice, internal medicine, and rheumatology have a greater prevalence of patients with spine pain treated with opioids, and that the current findings are lower than what a more heterogeneous physician sample might show.

In a large sample of physicians, Turk et al¹⁶ showed that physicians relatively infrequently prescribe opioids for patients with chronic pain on a long-term basis, and the current findings may support this declaration. “Relatively infrequently” implies a control or comparison group, but there is no such group. The prevalence of opioid use in patients with noncancer pain is unknown. “Relatively infrequently” also implies an understanding of the therapy’s risks and benefits. At best, researchers have only a rudimentary understanding of the risks and benefits associated with long-term opioid treatment of patients with noncancer pain. It may be that a frequency of 3.4% is too high if efficacy is shown to be low or risks high.

A greater incidence of objective findings was identified in the opioid group. These include dermatomal pain distribution, radiation of pain, and incidence of neurologic signs. Other investigators trying to describe differences between patients treated with opioids and those not so treated have not found a difference in the presence of physical findings. Turk and Okifuji¹⁷ have shown that on the basis of the Medical Examination and Diagnostic Information Coding System (MEDICS), physical findings do not play a significant role in the prescribing of opioids. Their sample included 191 patients referred to a chronic pain facility, 42% of whom were taking opioids at the time of referral. The patient population was heterogeneous in their descriptions of body areas in pain. Only 22% of these patients had low back pain. The MEDICS includes 18 medical procedures used in chronic pain assessment:¹³ spine mobility, observation of gait and posture, and a variety of other procedures including radiography and computed tomography scanning. Objective findings described in the NSN population are more specific and do not include diagnostic radiologic tests or more subjective findings such as observation of gait. In addition, the populations are dissimilar. The NSN population is composed entirely of patients with spine and radicular symptoms, as compared with the Turk and Okifuji population, which included abdominal pain, limb pain, headache, and pain at other body sites. The higher prevalence of objective findings in the patients treated with opioids, as described in this study, may help to support the uncertainty of prescribing physicians about appropriateness of therapy, which is a common dilemma in the prescription of opioids.³

In the current study, the medication effect did not seem to differ between patients treated with opioids and those not so treated. The patients treated with opioids and the patients not so treated were not compared with

controls for such factors as duration of pain, severity of pain, dose of opioid, and type of opioid. It was notable that no demonstrable difference in the effects of medication on patient-reported pain was observed between the two groups, and that nearly 20% of patients in both groups were unaffected or worse with the use of medications. In the current sample, prior response to drugs was not a factor implicated in the selection of opioid as a therapeutic option.

The SF-36 scores reflected that the patients treated with opioids perceived their pain as greater. These patients reported that the pain interfered more with their physical and social functioning, as compared with patients not treated with opioids. They also thought their pain interfered more with their physical role than did the patients not treated with opioids. Although these group differences in scale scores are statistically significant, the differences between the two groups may not be clinically significant. That is, the scores for both groups are well below normative samples, and both groups would be considered significantly impaired in physical functioning.

The decision whether to prescribe opioids involves medical, intellectual, emotional, and logistic factors.³ Possible negative consequences include time-consuming events, failures in the physician–patient relationship, worry about the patient, discontent with one’s own actions, and feelings of lacking competence.³ Whereas many physicians believe that opioids are useful for chronic noncancer pain, no good support exists for either efficacy or risk of long-term therapy. Additionally, the surgeons, physiatrists, and neurologists in the current sample may have felt they did not understand the complexity of patient selection and follow-up evaluation, and may not have been willing or able to commit the scarce resource of time necessary for this type of management.

This is the first large scale report on the prevalence of opioid use in patients with spine and radicular pain. Patients with both acute and chronic pain are treated with opioids by physicians in specialty spine care centers. Any comment on the prevalence of opioid use in this sample can only be arbitrary. Whether 3.4% is too small or too large a percentage is based entirely on the bias of the observer.

■ Key Points

- This observational study identified the prevalence of opioid use in 25,479 patients with spine and radicular pain and described their characteristics.
- Overall, 3.4% of the study patients had opioids included in their care plan.
- The prevalence of opioid use in a large population of patients with spine and radicular pain appears to be low, suggesting a conservative approach in a sample of spine specialists from the United States. This may in turn reflect a lack of

proven efficacy for opioids in patients with chronic pain.

- Patients treated with opioids had a greater incidence of objective findings including dermatomal pain distribution, radiation of pain, and incidence of neurologic signs.
- Patients with a diagnosis of herniated disc, fracture caused by trauma, or acute sprain were more likely to be treated with opioids than patients with a diagnosis of spinal stenosis, chronic sprain, chronic pain syndrome, idiopathic scoliosis, or spondylolisthesis.

References

1. Acute Pain Management Guideline Panel. Clinical Practice Guideline. Acute Pain Management: Operative or Medical Procedures and Trauma. (AHCPR publication no. 92-0032). Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research, 1992.
2. American Academy of Pain Medicine and the American Pain Society. The use of opioids for the treatment of chronic pain: a consensus statement. *Clin J Pain* 1997;13:6-8.
3. Bendsen P, Hensing G, Ebeling C, et al. What are the qualities of dilemmas experienced when prescribing opioids in general practice? *Pain* 1999;82:89-96.
4. Bouckoms AJ, Mesand P, Murray GB, et al. Chronic nonmalignant pain treated with long-term oral narcotic analgesics. *Ann Clin Psychiatry* 1992;4:185-92.
5. Brena SF, Sanders SH. Opioids in nonmalignant pain: questions in search of answers. *Clin J Pain* 1991;7:342-5.
6. Hays RD, Shapiro MF. An overview of health-related quality of life measures for HIV research. *Qual Life Res* 1992;1:91-7.
7. Jamison RN, Anderson KO, Peeters-Asdourian C, et al. Survey of opioid use in chronic nonmalignant pain patients. *Reg Anesth* 1994;19:225-30.
8. Jamison RN, Raymond SA, Slawsby EA, et al. Opioid therapy for chronic noncancer back pain. *Spine* 1998;23:2591-60.
9. Maier C, Hildebrandt J, Klinger R, et al. Efficacy of Oral Morphine in Chronic Nonmalignant Pain. *Abstr 8th World Cong Pain* 1996;159:50.
10. Management of Cancer Pain Guideline Panel. Clinical Practice Guideline. Management of Cancer Pain (AHCPR publication no. 94-0592). Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research, 1994.
11. Moulin DE, Iezzi A, Amireh R, et al. Randomized trial of oral morphine for chronic non-cancer pain. *Lancet* 1996;37:143-7.
12. Porteney RK. Chronic opioid therapy in nonmalignant pain. *J Pain Symptom Manage* 1990;5(Suppl 1):S46-62.
13. Rudy TE, Turk DC, Brena SF. Differential utility of medical procedures in the assessment of chronic pain patients. *Pain* 1988;34:53-60.
14. Schulzeck S, Gleim M, Maier C. Morphine tablets for chronic non-tumor-induced pain: which factors modify the success or failure of long-term therapy? *Anaesthetist* 1993;42:545-56.
15. Turk DC, Brody MC. What position do APS's physician members take on chronic opioid therapy? *Am Pain Soc Bull* 1992;2:1-7.
16. Turk DC, Brody MC, Okifuji EA. Physicians attitudes and practices regarding the long-term prescribing of opioids for noncancer pain. *Pain* 1994;59:201-8.
17. Turk DC, Okifuji A. What factors affect physicians' decisions to prescribe opioids for chronic noncancer pain patients? *Clin J Pain* 1997;13:330-6.
18. Ware JE, Sherbourne CD. The MOS 36-Item Short-Form Health Survey (SF-36): I. Conceptual framework and item selection. *Med Care* 1992;30:473-83.
19. Ware JE, Snow K, Kosinski M, et al. SF-36 Health Survey: Manual and Interpretation Guide. Boston: The Health Institute, 1993.

Address reprint requests to

Gilbert J. Fanciullo, MD
 Pain Management Center
 Dartmouth-Hitchcock Medical Center
 One Medical Center Drive
 Lebanon, NH 03756
 E-mail: Gilbert.J.Fanciullo@Hitchcock.org