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Spine and Pain Clinics Serving North Carolina Patients With Back and Neck Pain:

What Do They Do, and Are They Multidisciplinary?

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Abstract

Study Design—Cross-sectional survey.

Objective—Our primary objective was to describe spine and pain clinics serving North Carolina residents with respect to organizational characteristics. Our secondary objective was to assess the multidisciplinary nature of the clinics surveyed.

Summary of Background Data—Pain clinics have become common in the United States, and patients with chronic back pain have increasingly been seeking services at these clinics. Little is known about the organizational characteristics of spine and pain clinics.

Methods—We identified and surveyed spine and pain clinics serving North Carolina residents with chronic back and neck pain. Practice managers at 46 clinics completed a 20-minute questionnaire about the characteristics of their clinic, including providers on staff and services offered. Descriptive and exploratory analyses were conducted to summarize the data. Several variables were constructed to assess the multidisciplinary nature of the clinics.

Results—The response rate was 75%. There was marked heterogeneity among the clinics surveyed. Fifty-nine percent of practices were free-standing (n = 27) and 61% were physician-owned (n = 28). Twenty-five clinics (54%) had an anesthesiologist. Other common physician providers were physiatrists and surgeons. Less than one third of sites had mental health providers (n = 12; 26%); only 26% employed physical therapists. Seventy-six percent of sites offered epidural injections, 74% long-term narcotic prescriptions, and 67% antidepressants. The majority of clinics (30 of 33) prescribing narcotics provided monitoring of therapy using periodic urine toxicology testing. Forty-eight percent of sites (n = 22) offered exercise instruction. Few clinics were multidisciplinary in nature. Only 3 (7%) met the criteria of having a medical physician, registered nurse, physical therapist, and mental health specialist.

Conclusion—Clinics varied widely in their organizational characteristics, including providers and scope of services available. Few clinics were multidisciplinary in nature. This information should be used to determine how pain clinics can better serve patients and improve outcomes.

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The device(s)/drug(s) is/are FDA-approved or approved by corresponding national agency for this indication.

Keywords

chronic low back pain; chronic neck pain; organization and administration; health services research; multidisciplinary pain clinics

Chronic spinal pain is a common and costly problem in the United States.^{1,2} In a 2002 prevalence study, low back pain lasting at least a whole day in the past 3 months was reported by over 26% of US respondents, and neck pain was reported by over 13%.² Perhaps, because the condition affects the physical, mental, emotional, social, and financial well-being of those afflicted,^{3,4} individuals often seek care from numerous physicians as well as other traditional and alternative health care providers. It is also common for individuals to undergo numerous treatments over months or years.⁵ In the past few decades, pain clinics became common—in the mid-80s, it was estimated that there were more than 1200 pain clinics in existence in the United States.⁵ People with chronic spinal pain have increasingly been seeking services at these clinics.

Pain clinics have been described in various ways. According to Bonica,⁶ who has been credited with the development of modern multidisciplinary pain clinics,⁷ one key feature of a pain clinic is its ability to provide comprehensive assessment of an individual with a persisting and oftentimes intractable pain problem. Multidisciplinary function arose from Bonica's method of referring patients to other types of specialists, then reconvening to discuss the patient and reach consensus on the best course of action. Carron⁸ and Johnson⁹ have classified pain clinics as single modality clinics—such as those that offer nerve blocks—that are typically run by one provider type (*i.e.*, anesthesiologist); syndrome-oriented clinics, such as back pain or headache clinics; and comprehensive clinics that are multidisciplinary and treat a variety of chronic pain problems. This classification is neither necessarily exhaustive nor mutually exclusive and as Johnson *et al* note,⁹ many clinics do not fall into these categories.

The definition of multidisciplinary pain clinics also varies. According to the International Association for the Study of Pain (IASP), a multidisciplinary pain clinic should be staffed with a variety of physician and nonphysician providers who specialize in the diagnosis and treatment of chronic pain.¹⁰ At a minimum, 3 physician specialties should be represented including a psychiatrist, or 2 physician specialties and a clinical psychologist.¹⁰ Shealy and Cady's minimum criteria for multidisciplinary pain management are a physician (Medical Physician or Physician of Osteopathy), registered nurse, psychologist/psychotherapist or someone with a Master's degree in social work, and a physical therapist.¹¹

Although many pain clinics specialize in the treatment of chronic back and neck pain, to date there has been little study in the United States of what constitutes a spine/pain clinic, who provides care at these clinics, and what types of care are provided. There is evidence that multidisciplinary biopsychosocial rehabilitation improves outcomes in chronic back pain, when compared with inpatient or outpatient nondisciplinary and/or “unimodal” treatments.¹²⁻¹⁴ Whether and to what extent current spine and pain clinics are “multidisciplinary” has not been evaluated to date.

The primary objective of our study was to describe spine and pain clinics serving North Carolina (NC) residents with chronic back and/or neck pain. Specifically, we were interested in types of providers and services offered, and organizational characteristics of the clinics. Our secondary objective was to assess the multidisciplinary nature of the clinics surveyed. The substantial costs of back pain¹⁵ mandate examination of current treatment patterns¹⁶; gaining a better understanding of the nature of spine and pain clinics will help to inform future clinical and health services research on the treatment of chronic spinal pain.

Materials and Methods

Overview of Study

We identified spine and pain clinics serving NC residents; this included 3 practices located in Virginia adjacent to sparsely populated areas in the north of NC. We then contacted the practice managers (or similarly qualified respondents) at these clinics to determine eligibility for participation. To be eligible, the respondent had to confirm that the clinic treated patients with chronic (defined as 3 months or more) back and neck pain. Respondents at eligible clinics were then surveyed to gather information about the organization of the clinic and the types of patients served. This study was approved by the Institutional Review Board of the University of North Carolina at Chapel Hill.

Development of Survey

The study team, which consisted of an internal medicine physician, physical therapist, registered nurse, social worker, epidemiologist, and economist, developed and reviewed the survey, which gathered information on organizational characteristics of the clinics, including: location, ownership, numbers of physician and nonphysician providers, average number of patient visits per week, average charge for an initial evaluation, types of problems treated at the clinic, and patient insurance. The survey also gathered specific information on types of physician and nonphysician providers at the clinic, and the various services offered. To reduce respondent burden, we created check lists of the various providers and services that could be offered, including an “other” category.

Identification of Spine and Pain Clinics

Two approaches were used to identify spine and pain clinics (Figure 1): (1) surveying NC residents with chronic back and/or neck pain and (2) searching the NC yellow pages.

We first identified clinics by surveying a representative sample of NC adults 21 years and older ($n = 873$) who reported having chronic back and/or neck pain. These individuals were participants in a population-based phone survey we conducted on characteristics and care-seeking behaviors of NC residents with chronic back and neck pain. We defined chronic pain as: (1) pain and activity limitations nearly every day for the past 3 months; or (2) more than 24 episodes of pain that limited activity for 1 day or more in the past year. Subjects were asked whether, within the previous year, they had been seen at a spine or pain clinic—defined as a practice with multiple practitioners from different specialties who specialize in treating back/neck pain. Subjects who were seen at a spine/pain clinic ($n = 120$) provided a clinic name, location, and/or name of the treating provider. On the basis of this information, we identified 62 unique potential spine/pain clinics. We attempted to contact these clinics primarily by telephone, and by email, fax, and mail. Eleven could not be contacted after at least 6 attempts, 10 were contacted but found ineligible (*i.e.*, did not treat chronic back and neck pain), and 1 refused participation. The response rate for this mode of recruitment was 77% (40 of 52 eligible or unknown-eligibility sites).

Our second approach was a computerized search of the NC yellow pages for multidisciplinary spine or pain practices. Single-specialty practices, such as chiropractic or orthopedic practices treating back and neck pain, were not sampled. This generated 166 yellow pages listings that were independently examined by 2 reviewers (T.C. and A.J.); 151 (91%) of these listings were found to be duplicates and/or had already been identified by our first identification approach described above. There were many duplicates with this approach because clinics were often listed repeatedly under multiple counties within driving distance. Of the 15 remaining sites, 4 were nonresponders, 5 were ineligible, 0 refused, and 6 responded. The response rate was 60%

(6 of 10 eligible). Surveys were completed by a total of 46 clinics with an overall response rate of 75%.

Survey Administration

The survey was primarily administered by phone, but respondents were also given the options of email, fax, and regular mail as secondary modes of survey completion. By phone, the survey took 15 to 20 minutes. Sites contacted by phone were offered \$25 to participate. Sites that did not respond to phone queries were provided \$20 cash in a hard copy mailing of the survey that solicited their participation.

Data Analysis

All analyses were conducted using SAS software version 9.1.¹⁷ We used frequencies, proportions, and distributions to describe the data.

To facilitate analyses, we grouped the 19 provider types based on the results of the descriptive analyses and the clinical experience of the team. We created 2 groupings according to function (9 categories) or discipline (4 categories). The 9-category grouping comprised (1) surgeons (orthopedic and neurosurgeons), (2) anesthesiologists, (3) physical medicine and rehabilitation physicians (PM&R), (4) primary care physicians (family medicine, internal medicine), (5) medical specialty physicians (neurologists, rheumatologists, occupational medicine), (6) nonphysician allopathic clinicians (nurse practitioners, physician assistants, clinical pharmacists/PharmDs, nutritionists), (7) physical therapists, (8) mental health professionals (psychiatrists, psychologists), and (9) alternative medicine practitioners (massage therapists, acupuncturists, chiropractors). The 4-category grouping comprised (1) allopathic medicine (surgeons, anesthesiologists, PM&R, primary care, medical specialists, and nonphysician allopathic clinicians), (2) physical therapists, (3) mental health practitioners, and (4) alternative medicine practitioners.

Similarly, we grouped the 35 possible services offered into 8 categories: imaging, physical methods, exercise/nutrition/ education, alternative therapies, injections, outpatient procedures, medications, and off-site services.

We assessed associations between provider and service types by examining cell count proportions for 2*2 tables within each potential provider-service combination. To examine bivariate associations, we used Fisher exact tests for differences in proportions.

We created several variables to measure multidisciplinary function. On the basis of the Shealy and Cady criteria,¹¹ we created a variable to indicate whether clinics were multidisciplinary by this standard (*i.e.*, had an MD, RN, PT, and mental health specialist). We created a second variable to reflect the IASP criteria for multidisciplinary function: 3 physician specialties including a psychiatrist, or 2 physician specialties and a clinical psychologist.¹⁰ We created 4 additional variables based on provider and service offerings as follows: 2 provider indexes based on different types of providers at each site using the 9-category (index from 1 to 9) and 4-category (index from 1 to 4) groupings, and 2 service indexes based on the 35 services (index from 1 to 35) and the 8-category grouping (index from 1 to 8).

Results

The 46 clinics were distributed across the state and represented the major NC population centers (Figure 2). The presence of the 2 Virginia sites closest to the Atlantic coast reflects a pattern of patients in the sparsely populated Northeast part of NC seeking care in the greater Norfolk, Virginia area.

Organizational Characteristics

Clinics were heterogeneous with regard to organizational characteristics (Table 1). The majority were physician-owned and freestanding. Physician ownership was associated with freestanding location, but was not statistically significant (Mantel-Haenszel $\chi^2 P = 0.07$). The median number of providers for hospital-owned clinics was 13 whereas the median for physician-owned clinics was 6 (Wilcoxon $P = 0.0015$).

Providers

Practices were generally small with a median of 3 physician and 4 nonphysician providers [including registered nurses (RNs)]. The median number of total providers (physician and nonphysician) was 7. Over half (24, or 52%) of clinics employed RNs. The majority of clinics (70%) reported having between 1 and 5 physicians. Two practices had over 30 providers each: one with 50 providers (hospital-owned, freestanding) and one with 46 providers (physician-owned, freestanding). Thirty sites (65%) reported having physicians certified in pain management. Thirty-eight (83%) sites reported having physicians who also cared for patients who are hospitalized.

Table 2 displays frequencies and rankings of providers, based on individual provider types and the 9-category provider grouping by function. Of the 46 clinics, over half had an anesthesiologist; the most common other types of physicians were psychiatrists and surgeons. Over half of clinics reported having an RN. Only 3 sites reported having physicians of chiropractic. Ten sites (22%) had psychologists and only 1 site had a psychiatrist.

We examined the similarities and differences of provider types across sites using the 4-category grouping (Figure 3). Using the 4-category grouping by discipline, 44 sites had providers who represented allopathic medicine, 12 physical therapy, 12 mental health, and 11 alternative medicine. The most common configuration of providers was allopathic only ($n = 24$, or 52%). The second most common configurations were either allopathic and physical therapy ($n = 4$) or allopathic and mental health ($n = 4$).

Services

Table 3 displays the proportions of sites offering each service, and the ranking of how commonly these services were offered across sites. The median number of services offered was 14 of a possible 35, with medications, trigger point injections, and epidurals/facet injections being most commonly offered, and back school and massage therapy being the least commonly offered. Using the 8-category groupings, injections were the most commonly offered service, followed by medications, imaging, and off-site services. Out of 8 possible service types, the median number of service types offered was 6. One site offered only injections and medications, and no other services.

Provider-Service Associations

Associations between the most common provider types and services offered are presented in Table 4. The table lists associations for which (a) the 2-sided P -value was less than 0.05 in Fisher exact tests of proportions in 2*2 tables, and (b) the difference in proportions was greater than 0.4 or less than -0.4 (to focus only on the more clinically meaningful associations). Although provider types generally tracked with service types (*e.g.*, cognitive behavioral therapy was more likely to be offered at sites with a mental health practitioner), there was not always a one-to-one match; 20 sites had no physical therapist provider but offered physical methods. No clinically meaningful associations were found between presence of RNs and any of the services.

Multidisciplinary Function

As shown in Table 5, only 3 of the 46 sites surveyed met all of the Shealy and Cady criteria for multidisciplinary function.¹¹ Ten of the 46 sites met 3 or more of these 4 criteria. Only 2 of the 46 sites met the IASP criteria for multidisciplinary function.¹⁰ Although we observed a variety of different services across all sites, the most common scenario was only one provider type, and that type was allopathic (24/46).

Discussion

Our aims were to describe organizational characteristics of spine and pain clinics serving patients in NC, and to assess the multidisciplinary function of these clinics. Results of this study indicate heterogeneity among the 46 clinics with regard to ranges of provider types available, services offered, and multidisciplinary function. This finding confirms past evidence for wide variations in practice among outpatient pain clinics.¹⁸

The majority of sites had between 1 and 5 physicians, and providers tended to be concentrated in the allopathic discipline. Services offered tracked with provider types (*e.g.*, sites that had physical therapists were more likely to offer supervised exercise programs). Physical therapists, mental health providers, or alternative medicine providers were each practicing in less than one third of the practices. This finding may denote room for improvement among these clinics, given evidence supporting an active approach in the treatment of chronic back and neck pain.¹⁹ We were especially impressed by the ubiquity of injection treatments at these practices. Epidural and other injections are increasingly used for lumbar and cervical pain. Although there is evidence for the efficacy of these therapies in the short-term, evidence regarding longer term effectiveness is more controversial.²⁰⁻²²

Almost all clinics offered prescription of pain medications including narcotics. We were encouraged that the majority of clinics (30 of 33 sites) that did prescribe narcotics provided monitoring of therapy using periodic urine toxicology testing.²³

We explored multidisciplinary function in light of evidence for multidisciplinary biopsychosocial models in improving chronic pain outcomes.¹⁴ Only 3 sites met the Shealy recommendation for a comprehensive pain management team and only 2 sites met the IASP criteria. Issues of enhancing physical function through exercise and attention to mental health issues were not addressed at many practice sites. Many spine and pain clinics focus on the “bio” in the biopsychosocial model with much less attention to psychosocial issues, at least through examination of their staffing and structural characteristics.

Limitations

One potential limitation of this study is possible bias due to systematic differences between clinics identified through the patient survey and clinics identified through the yellow pages. We conducted a sensitivity analysis to determine if any such differences existed; none of the site characteristics differed between the 2 recruitment methods except that the percentage of patients estimated to be insured by workers' compensation was lower for sites recruited from the yellow-pages (5%) *versus* sites recruited from the patient survey (10%) (Kruskal-Wallis test P -value = 0.01).

Another potential source of error is the lack of clear definition for certain self-reported variables. For example, we did not probe the 30 sites that reported having physicians certified in pain management to find out their criteria for certification (*e.g.*, accrediting body).

Because we did not assess sites' use of consultants or referrals for mental health services, we looked into the possibility that our results underrepresented these types of providers. We used

our parent study data to examine whether large numbers of spine/pain clinic patients received mental health services outside of the pain clinics. Of the 120 patients in the parent survey dataset who were seen at pain/spine clinics, 18% saw a mental health provider; half of these were at the clinic, and the other half were elsewhere. This implies that our finding that 22% of sites had a psychologist and 2% had a psychiatrist was not an underestimation of the care being sought and/or received.

Our study relied on discussions with the practice manager, not site visits. Our team judged that the practice manager would be the person most knowledgeable regarding the number and type of practitioners at the clinic, as well as issues of practice ownership; however, this feedback could have contained inaccuracies. Further studies regarding the characteristics of spine and pain clinics would require chart abstractions and/or site visits.

Strengths

One strength of the present study was that it is one of the first to broadly survey spine and pain clinics about what they do. This information is needed to understand how these clinics can better serve patients and improve outcomes.

Secondly, this study was designed to achieve a census of spine and pain clinics serving the residents of one state. Most clinics were identified through the statewide survey of patients, and when we supplemented the patient-based survey with a computerized yellow pages survey, few additional clinics were identified, suggesting that the survey-based sample selection resulted in a near universe of these clinics.

Future Research

Existing treatment recommendations for chronic back pain include coordinated case management,¹² and the promotion of collaboration and integration of care from various providers. There is also evidence from several studies that intensive multidisciplinary biopsychosocial rehabilitation with functional restoration improves function among patients suffering from chronic pain.¹⁴ Although collaboration between disciplines may take place at clinics with more than one provider type, the provider teams among the sites surveyed did not generally represent multiple disciplines. Future research should examine patient characteristics, long-term outcomes, and costs of care at pain clinics. Future research should also assess degrees of interdisciplinary collaboration, and the integration of biopsychosocial models in spine/pain clinics.

Key Points

- There was heterogeneity across the 46 sites surveyed. Most practices were small in regard to total number of providers.
- Almost all sites offered epidurals and/or trigger point injections, as well as medication prescription. The majority of sites conducted routine urine toxicology screening.
- Ninety-three percent of the sites surveyed did not have representation of a full range of disciplines, defined as: at least 1 physician, 1 registered nurse, 1 mental health provider, and 1 physical therapist. Future research should examine patient characteristics of patients who seek care at spine and pain clinics, and further assess integration of biopsychosocial models in these clinics.

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^A Note: Uncertain eligibility/non-response indicates that we were unable to locate the clinic or unable to make initial contact to determine the nature of the clinic.

Figure 1.
Flow diagram showing survey recruitment, eligibility, and response.

Figure 2.
Spine and pain clinic geographic locations; N = 46 clinics.

Figure 3.
Provider types (4-category grouping) at each of the 46 clinics.

Table 1
Spine and Pain Clinic Organizational Characteristics (N = 46 Clinics)

	Range	Median (IQ Range)	Mean (SD)
Percentage of patients with			
Chronic back and/or neck pain?	5-100	78 (50-90)	68 (26)
Acute back and/or neck pain?	5-90	20 (10-40)	26 (21)
Other chronic pain?	1-45	13 (9-25)	17 (12)
Percentage of patients insured by...			
Medicaid	0-20	40 (25-50)	37 (16)
Medicaid	1-30	15 (10-20)	16 (9)
Worker's compensation	1-30	10 (5-10)	9 (6)
Commercial insurance	4-70	30 (15-40)	29 (16)
Self-pay (no insurance)	0-70	5 (3-10)	9 (14)
Auto insurance for neck pain	0-20	3 (1-10)	5 (6)
Average no. of patient visits/wk	10-2700	163 (68-300)	286 (488)
Average charge for initial evaluation (\$)	60-465	200 (100-250)	198 (99)
No. of providers			
physicians	0-21	3 (1-8)	5 (5)
Nonphysicians	0-37	4 (2-8)	6 (7)
		n	% *
Clinic location			
Hospital or campus		40	40
Freestanding		60	60
Clinic ownership			
Hospital		30	30
Physician		61	61
Co-owned: hospital and physician		4	4
Federal		4	4

IQ indicates interquartile range (25th and 75th percentile values shown); SD, standard deviation.

* Percentage of nonmissing values.

Table 2
Number and Proportion of Sites With Each Provider Type (N = 46 Clinics)

Provider Type	n (%) [*]	Rank [†]	
		Individual	Group
Nonphysician allopathic clinicians			
Physician assistants	14 (41)	2	1
Nurse practitioners	14 (30)	4	
Clinical pharmacists, also called PharmDs	1 (2)	16	
Anesthesiologist	1 (2)	16	
Anesthesiologists	25 (56)	1	2
Physiatrists	15 (33)	3	3
Surgeons			
Orthopedic surgeons	8 (18)	9	4
Neurosurgeons	7 (16)	10	
Physical therapists	12 (26)	6	6
Mental health practitioners			
Psychiatrists	11 (24)	7	6
Psychiatrists	1 (2)	16	
Alternative medicine practitioners			
Acupuncturists	9 (20)	8	7
Massage therapists	4 (9)	12	
Doctors of chiropractic	3 (7)	14	
Medical specialists			
Other types of nonphysician specialists	13 (28)	5	8
Other types of physician specialists	5 (11)	11	
Neurologists	4 (9)	12	
Rheumatologists	1 (2)	16	
Occupational medicine physicians	0 (0)	20	
Primary care physicians			
Family medicine physicians	3 (7)	14	9
Internal medicine physicians	0 (0)	20	

* Percentage of nonmissing values.

[†] Providers are first sorted by frequency according to the 9-category grouping (column entitled "Group") and then sorted within these categories by individual frequency (column entitled "Individual").

Table 3
Services Offered, With Across-Site Rankings (N = 46 Clinics)

	n (%) [*]	Rank [†]	
		Individual	Group
Injectons			
Trigger point injections	40 (87)	2	1
Epidural injections or facet injections	35 (76)	3	
Medications			
Medications prescription	41 (89)	1	2
Management of long-acting narcotic medications	34 (74)	4	
Prescriptions of pain-modulating medication	33 (72)	5	
Prescriptions of antidepressants	31 (67)	6	
Routine urine toxicology screening	30 (65)	7	
Imaging			
EMG/nerve conduction studies	20 (43)	14	3
Plain radiographs	19 (41)	15	
Myelograms/discograms -onsite	16 (35)	19	
Magnetic resonance imaging	11 (24)	24	
Computed tomography scans	9 (20)	29	
Off site services			
Spinal cord or nerve stimulators - offsite	26 (57)	8	4
Myelogram/discogram at a hospital or surgicenter	23 (50)	10	
Percutaneous discectomy -offsite	18 (39)	16	
Spine surgery	14 (30)	21	
Intradiscal electrothermal therapy (IDET) - offsite	11 (24)	24	
Exercise/nutrition/education			
Exercise instruction	22 (48)	12	5
Supervised exercise program	17 (37)	18	
Dietary advice	16 (35)	19	
Group education classes	10 (22)	26	
Cognitive behavioral therapy	10 (22)	26	
Work hardening program	9 (20)	29	
Back school	8 (17)	34	
Physical modalities			
TENS unit	24 (52)	9	7
Braces and orthotics	21 (46)	13	
Physical therapy modalities such as heat, cold, and Tractiond	18 (39)	16	
Traction devices	14 (30)	21	
Outpatient procedures (invasive)			
Spinal cord or nerve stimulators - onsite	23 (50)	10	7
Intradiscal electrothermal therapy (IDET) - onsite	12 (26)	23	
Percutaneous discectomy -onsite	9 (20)	29	
Alternative therapies			

	n (%) [*]	Rank [†]	
		Individual	Group
Acupuncture	10 (22)	26	8
Advice on herbal or homeopathic therapies	9 (20)	29	
Spinal manipulation/mobilization	9 (20)	29	
Massage therapy	7 (15)	35	

* Percentage of nonmissing values.

[†] Services are first sorted by frequency according to the 8-category grouping (column entitled "Group") and then sorted within these categories by individual frequency (column entitled "Individual").

Provider-Service Associations for Most Common Provider Types

Table 4

Provider Type	Service	Proportion of Clinics Offering Service		Difference in Proportionist
		Clinics With Provider*	Clinics Without Provider	
Anesthesiologists (n = 25)	Epidural/facet injections	1.00	0.45	0.55 [†]
	Spinal cord or nerve stimulator management	0.76	0.24	0.52
	Spinal manipulation	0.04	0.44	-0.40
Physical therapists (n = 15)	Braces/orthotics	0.32	0.65	0.40
Physical therapists (n = 12)	Modalities such as heat, cold, or ultrasound	0.78	0.32	0.45
	Supervised exercise programs	0.91	0.21	0.70
	Exercise instruction	0.91	0.35	0.56
	TENS unit	1.00	0.44	0.56
	Braces/orthotics	0.83	0.32	0.51
Mental health (n = 12)	Spine surgery (off site)	0.64	0.21	0.43
	Cognitive behavioral therapy	0.75	0.03	0.72
	Spinal cord or nerve stimulator management	0.23	0.69	-0.46
Orthopedic or neurologic surgeons (n = 14)	Management of long-acting narcotics	0.46	0.88	-0.41
	Routine urine toxicology screening	0.40	0.90	-0.50
	Prescription of pain-modulating medications	0.33	0.84	-0.51
	Prescription of pain-modulating medications	0.42	0.90	-0.49
	Supervised exercise programs	0.69	0.25	0.44
	Myelogram/discogram at hospital	0.79	0.39	0.40
	Spine surgery (off site)	0.86	0.06	0.79

The table lists associations for which (a) the 2-sided *P* was less than 0.05 in Fisher exact tests of proportions in 2*2 tables, and (b) the difference in proportions was greater than 0.4 or less than -0.4 (*i.e.*, only the stronger positive or negative provider-service associations).

* Using the first row as an example, the proportion of sites with at least 1 anesthesiologist that offered epidurals or facet injections was 1.0 (n = 25 of 25) versus 0.45 (n = 9 of 20) for sites without an anesthesiologist. The difference in proportions was thus (1.0-0.45) = 0.55.

† Difference in proportions estimates magnitude of difference between sites with and without each given provider type in proportion offering a given service. Exact confidence limits on estimates of difference in proportions could not be calculated because of low cell counts.

Table 5
Measures of Multidisciplinary Function (N = 46 Clinics)

Multidisciplinary Variable	n (%) or Median (Range) [IQ Range [*]]
Clinics that met 4 of the 4 Shealy criteria [†]	3 (7)
Clinics that met 3 of the 4 Shealy criteria [†]	7 (15)
Clinics that met IASP criteria [‡]	2 (4)
9-category provider index	2 (1-7) [2-4]
4-category service index	1 (1-4) [1-2]
35-category service index	14 (3-27) [10-18]
8-category service index	6 (2-8) [5-7]

^{*} IQ indicates interquartile range (25th and 75th percentile values shown).

[†] Shealy and Cady criteria: at least 1 physician, 1 registered nurse, 1 mental health provider, and 1 physical therapist.

[‡] International Association for the Study of Pain (IASP) criteria: at least 3 different physician specialties represented including a psychiatrist, or else 2 physician specialties with a clinical psychologist.