

Descriptive Epidemiology and Prior Healthcare Utilization of Patients in the Spine Patient Outcomes Research Trial's (SPORT) Three Observational Cohorts

Disc Herniation, Spinal Stenosis, and Degenerative Spondylolisthesis

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Study Design. Prospective observational cohorts.

Objective. To describe sociodemographic and clinical features, and nonoperative (medical) resource utilization before enrollment, in patients who are candidates for surgical intervention for intervertebral disc herniation (IDH), spinal stenosis (SpS), and degenerative spondylolisthesis (DS) according to SPORT criteria.

Summary of Background Data. Intervertebral disc herniation, spinal stenosis, and degenerative spondylolisthesis with stenosis are the three most common diagnoses of low back and leg symptoms for which surgery is performed. There is a paucity of descriptive literature examining large patient cohorts for the relationships among baseline characteristics and medical resource utilization with these three diagnoses.

Methods. The Spine Patient Outcomes Research Trial (SPORT) conducts three randomized and three observational cohort studies of surgical and nonsurgical treatments for patients with IDH, SpS, and DS. Baseline data include demographic information, prior treatments received, and functional status measured by SF-36 and the Oswestry Disability Index (ODI-AAOS/Modems version). The data presented represent all 1,411 patients (743 IDH, 365 SpS, 303 DS) enrolled in the SPORT observational cohorts. Multiple logistic regression was used to generate independent predictors of utilization adjusted for sociodemographic variables, diagnosis, and duration of symptoms.

Results. The average age was 41 years for the IDH group, 64 years for the SpS group, and 66 years for the DS

group. At enrollment, IDH patients presented with the most pain as reported on the SF-36 (BP 26.3 vs. 33.2 SpS and 33.8 DS) and were the most impaired (ODI 51 vs. 42.3 SpS and 41.5 DS). IDH patients used more chiropractic treatment (42% vs. 33% SpS and 26% DS), had more Emergency Department (ED) visits (21% vs. 7% SpS and 4% DS), and used more opiate analgesics (49% vs. 29% SpS and 27% DS). After adjusting for age, gender, diagnosis, education, race, duration of symptoms, and compensation, Medicaid patients used significantly more opiate analgesics (58% Medicaid vs. 41% no insurance, 42% employer, 33% Medicare, and 32% private) and had more ED visits compared with other insurance types (31% Medicaid vs. 22% no insurance, 16% employer, 3% Medicare, and 11% private).

Conclusion. IDH patients appear to have differences in sociodemographics, resource utilization, and functional impairment when compared with the SpS/DS patients. In addition, the differences in resource utilization for Medicaid patients may reflect differences in access to care. The data provided from these observational cohorts will serve as an important comparison to the SPORT randomized cohorts in the future.

Key words: SPORT, disc herniation, spinal stenosis, degenerative spondylolisthesis, epidemiology, outcomes, utilization of healthcare resources. **Spine 2006;31:806–814**

Intervertebral disc herniation (IDH), spinal stenosis (SpS), and degenerative spondylolisthesis with stenosis (DS) are the three most common diagnoses of low back and leg symptoms for which surgery is performed.¹ For this population of patients, there is a paucity of literature that has examined baseline medical resource utilization, as well as its relation to various demographic variables (age, sex, race, education, insurance type), or health status measures (SF-36, ODI).^{2,3}

Most epidemiologic literature in the area of spine is related to low back pain and its nonspecific diagnoses such as sprain, strain, *etc.*^{4,5} Information regarding the use of medical treatment for patients with a confirmed diagnosis of disc herniation, spinal stenosis, and degenerative spondylolisthesis is scarce at best. Studies comparing surgical treatment to conservative therapy for these three diagnoses give little detail as to which nonoperative therapies are used before surgical intervention.^{6–15} Most of the literature is based on case series or case reports.

The Spine Patient Outcomes Research Trial (SPORT) is prospectively collecting primary data from patients

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diagnosed as potential surgical candidates with IDH, SpS, and DS enrolled at multiple centers across the United States.¹⁶ Baseline information from SPORT will help inform patients, physicians, and healthcare organizations about the nonoperative treatments frequently used by patients with a diagnosis of IDH, SpS, or DS who are potential surgical candidates, as well as providing epidemiologic characterization of these groups of patients. The extent to which the choice of initial nonoperative treatment before enrollment in SPORT is affected by specific clinical, demographic, or socioeconomic factors is unknown.

The purpose of this paper is to provide descriptive epidemiologic data on resource utilization in patients who are potential candidates for surgical intervention by SPORT criteria for IDH, SpS, and DS. Because there are a wide variety of nonoperative treatment options for these diagnoses without clear clinical evidence as to which is best, we examined whether there are any differences in treatments provided to patients based on age, race, sex, education, insurance type, or health status. These baseline resource utilization data will lay the foundation for future SPORT publications in which we will examine how these treatments impact patient preference and outcomes.

■ Materials and Methods

The SPORT is being conducted at multiple clinical centers around the United States. The study design includes three separate prospective randomized clinical trials for IDH, SpS, and DS, accompanied by parallel observational studies of patients who meet inclusion criteria but decline to participate in the randomized studies.¹⁶ After patients met inclusion criteria (which includes a consistent clinical presentation, confirmatory imaging study, no prior spine surgery, and determination by the enrolling study physician that the patient is in fact a candidate for surgery) as previously described in detail,¹⁶ baseline data were obtained, including demographic information, prior treatments undertaken for their current spine-related problem, and Short Form 36 (SF-36)² and Oswestry Disability Index (ODI-AAOS/Modems version)³ baseline information. The final determination of being a “surgical candidate” was made by the enrolling physician and necessarily included some degree of clinical judgment regarding the severity of symptoms and overall health status. The generalizability of this cohort will thus need to be judged in part by closely examining the baseline demographic and health status information provided later in the manuscript. The data presented represent all 1,411 patients (743 IDH, 365 SpS, 303 DS) enrolled in the observational arm of the study. The randomization arm has also completed enrollment, and these data will be presented elsewhere.

Analysis. Univariate group comparisons were made using *t* tests, χ^2 tests, and one-way analysis of variance as appropriate. Although most questions on the patient surveys are required (*i.e.*, the computerized questionnaire does not allow the patient to proceed to the next question before responding) and therefore contain no missing data, there are some questions that permit the patient to respond “I prefer not to answer,” including race, ethnicity, and marital status. The proportion of “no answer” responses is very low (0%–3%) and these counts

and percents are omitted from the tables. For this reason, some column totals may not add to exactly 100%.

Adjusted Analyses. To isolate the independent association between diagnosis, demographic characteristics, and prior treatments, multiple logistic regression modeling was used.¹⁷ These analyses were limited to treatments and medications found to have statistically significant predictors in the univariate analysis. (Utilization of “passive methods” was nearly universal across diagnosis groups and not analyzed.) The binary response “outcome” for each model (a different model was fitted for each treatment) was set to 1 if the patient reported having had the treatment and zero otherwise. Each model included variables for age, gender, diagnosis, education, race, insurance type, duration of symptoms, and compensation. The logistic regression model results were used to estimate the adjusted proportions of patients receiving treatment in each diagnostic and demographic category. Adjusted proportions were computed by assuming covariate values equal to the mean values in the study population. All analyses were performed using S-Plus 6.1 (Insightful Corp., Seattle, WA).

■ Results

Patient Characteristics

A total of 1,417 patients were included in the observational cohort data collected between March 2000 and February 2003, with 743 in the IDH group, 363 in the SpS group, and the remaining 303 in the DS group (Table 1). A total of 913 of the 1,411 patients (64.7%) enrolled in the surgical arm of the cohort (70% of IDH patients, 60% of SpS patients, and 57% of DS patients). The average age of the IDH group was 41 years, over 20 years younger than the average of 64 and 66 years in the SpS and DS groups, respectively, reflective of the typical age distribution of these diagnostic categories. Significantly more females composed the DS group (71%) *versus* 43% IDH and 40% SpS. There are significantly fewer blacks in the IDH group (6%) compared with SpS (9%) and DS (11%), and there were slightly more Hispanics in the IDH group (3%) *versus* 1% in both the SpS and DS groups.

Regarding education, the IDH patients were more likely to have college degrees (30%) compared with the SpS (20%) and DS (16%) patients, but the stenosis groups (SpS and DS) were more likely to have graduate degrees. More of the IDH patients are single (18%), but this is likely a reflection of age difference between groups, as more of the SpS and DS patients are widowed (13% and 18%). A significantly larger proportion of the IDH patients are working, but they are also more disabled at baseline. Also, more IDH patients report having applied for or receiving Workers' Compensation (21% IDH *vs.* 8% SpS and 7% DS). These results are consistent with the older age and high number of retirees in the stenosis groups.

Comorbidities

As expected, there were significantly more comorbidities in the stenosis groups (SpS and DS) compared with the IDH patients (Table 1). The most common comorbidities reported in order of frequency are: concomitant joint

Table 1. Baseline Patient Characteristics

	IDH (n = 745)	SpS (n = 368)	DS (n = 304)	P*
Mean age (yr) (SD)	41.4 (11.2)	63.9 (12.5)	66.2 (10.6)	<0.001
Female (%)	43	40	71	<0.001
Race (%)				<0.001
White	91	85	84	
Black	6	9	11	
Asian	1	0	1	
Other/Mixed	2	6	5	
Ethnicity (%)				0.028
Hispanic	3	1	1	
Non-Hispanic	97	99	99	
Education (%)				<0.001
Less than HS	2	9	6	
High School Grad	23	28	28	
Some College	26	22	26	
College Grad	30	20	16	
Post-Grad Degree	20	21	24	
Marital status (%)				<0.001
Married	70	71	67	
Divorced	11	9	11	
Widowed	1	13	18	
Single	18	6	5	
Work status (%)				<0.001
Full Time	46	23	19	
Part Time	6	5	5	
No Time	10	3	1	
Unemployed	2	1	0	
Disabled	11	7	4	
Retired	2	30	25	
Homemaker	5	7	11	
Student	1	0	0	
(Multiple)	15	24	35	
Workers' Compensation/Disability† (%)	21	8	7	<0.001
Comorbidities				
Hypertension	12	44	45	<0.001
Stroke	0	2	3	<0.001
Diabetes	4	13	14	<0.001
Osteoporosis	2	10	12	<0.001
Cancer	3	6	9	<0.001
Fibromyalgia	2	2	3	0.31
Migraine	9	7	8	0.63
CFS	1	1	2	0.61
Depression	11	10	14	0.27
Anxiety	7	4	6	0.29
PTSD	1	1	2	0.72
Alcoholism	1	2	1	0.52
Drug dependency	0	1	0	0.91
Heart disease	4	24	20	<0.001
Lung disease	3	9	7	<0.001
Stomach problem	12	22	23	<0.001
Bowel or Intestinal	6	14	9	<0.001
Liver disease	1	2	2	0.2
Kidney disease	2	6	5	0.006
Blood vessel disease	2	6	7	<0.001
Nervous system disease	2	2	3	0.22
Joint disease	17	52	57	<0.001
Symptom duration (most recent episode) (%)				<0.001
6 wk or less	3	0	0	
7–12 wk	32	3	2	
3–6 mo	42	39	39	
7–12 mo	14	25	26	
>1 yr	9	33	33	

*The P value is a χ^2 P value for the entire variable.

†Percentage of "yes" responses to the question: "Have you applied to, or are you now receiving payments from either Workers' Compensation, Social Security Disability Insurance, or any other disability insurance programs for your spine-related problem?"

disease, hypertension, heart disease, stomach/intestinal problems, diabetes, and osteoporosis.

Duration of Symptoms

Patients in all three diagnostic groups most commonly had symptoms for between 3 and 6 months. In the SpS and DS groups, a significantly larger proportion of patients had a duration of symptoms greater than 1 year (33% and 33%) compared with the IDH group (9%) (Table 1). Thirty-five percent of patients in the IDH group had symptoms for fewer than 3 months.

Health Status

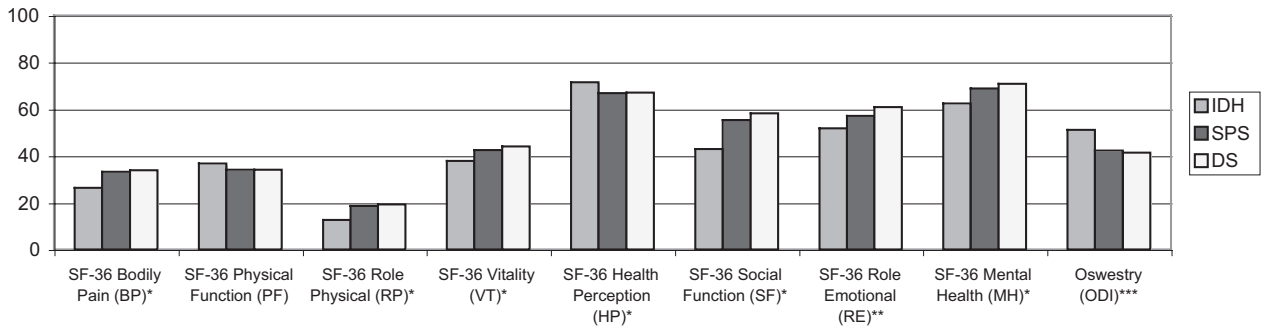
At baseline, IDH patients presented with the most pain as reported on the Bodily Pain (BP) scale of the SF-36, with an average score of 26.3 compared with SpS (33.2) and DS (33.8). The IDH group was also the most disabled with a score of 51.1 on the modified ODI compared with SpS (42.3) and DS (41.4) (Figure 1). The IDH group reported significantly lower scores on several other SF-36 scales, including Role Physical, Vitality, Social Function, Role Emotional, and Mental Health. The one scale that was significantly worse among the SpS and DS patients was the General Health Perception scale, which is consistent with the older age and greater number of co-morbidities in these two groups.

Nonoperative Treatments Received Before Enrollment

Diagnosis. Significantly more IDH patients (42%) had received chiropractic treatment compared with SpS (33%) and DS (26%) (Figure 2). IDH patients were also significantly more likely to have been seen in an Emergency Department (ED) setting (21%) compared with SpS (7%) and DS (4%) patients. Furthermore, prior use of opiate medications was significantly higher in the IDH group (49%) compared with SpS (29%) and DS (27%) patients, as was antidepressant and muscle relaxant use (29%) compared with SpS (19%) and DS (23%).

On the other hand, more patients in the stenosis groups (SpS, 40%; and DS, 43%) had been treated by an anesthesiologist or pain physician for their symptoms than IDH (32%). Also, more over-the-counter (OTC) medication use was reported by the DS and SpS patients (31% and 27%) versus IDH (19%).

Age. These same trends hold true when the study populations are stratified into age groups, reflective of the age distribution difference seen when the IDH group (younger) is compared with the SpS and DS groups (older). Patients under 60 years old were more likely to have seen a chiropractor and undergone manipulation compared with patients over age 60 (41% vs. 28%) (Table 2). Patients under age 40 are also more likely to have visited the ED (22%) compared with patients over 60 (5%) and were more likely to have received physical therapy (76%) compared with patients age 60 and older (66%). The trend in medication use was similar. Patients under age 40 used significantly more opiate medications (50% vs. 28%), and antidepressants and

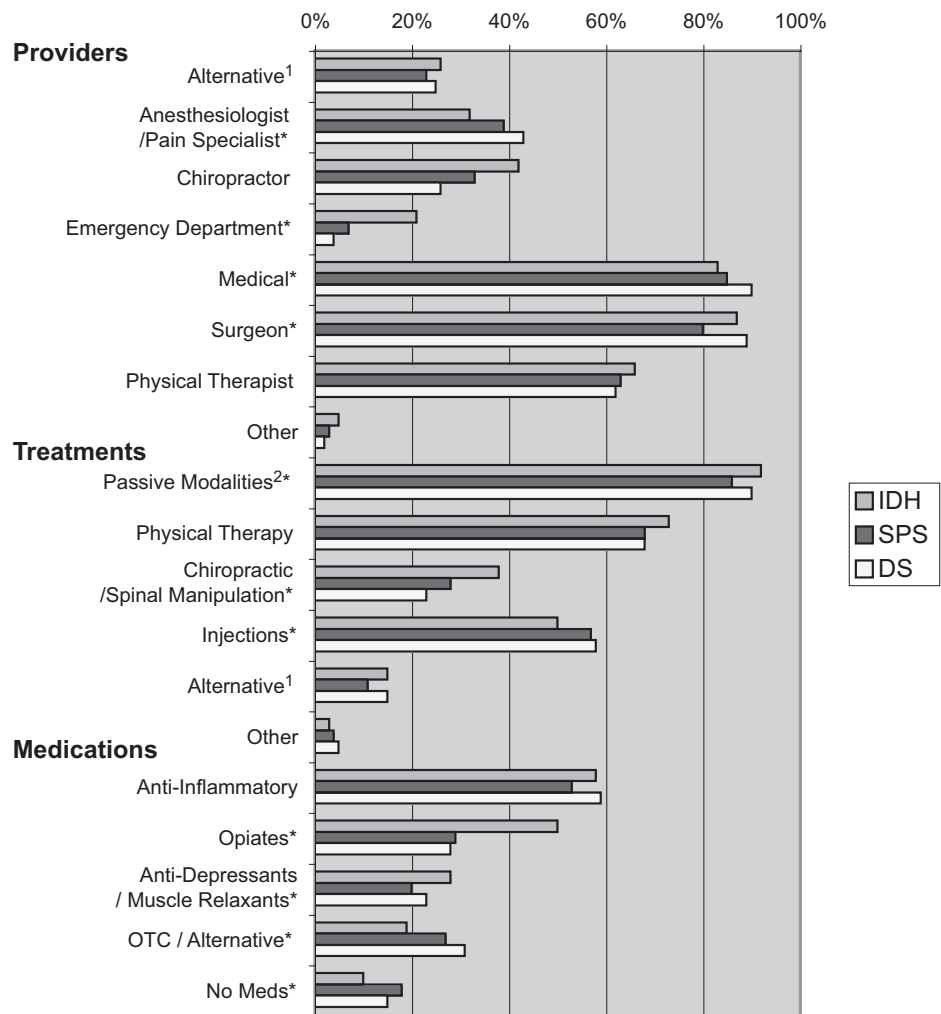


* IDH patients significantly different from SPS and DS (p<0.05)
 ** IDH patient significantly different from DS, not SPS (p<0.05)
 *** ODI has reverse scale: 100=disabled, 0=normal, IDH significantly different from SPS and DS (p<0.05).

Figure 1. Mean baseline health status scores (SF-36 and Oswestry) by diagnosis.

muscle relaxants (26% vs. 19%) compared with patients over age 60, while older patients used more OTC medications (33% vs. 16%) compared with patients under age 40.

Gender. Among different gender groups, females were more likely to have used alternative health care providers (29% vs. 21%), were more likely to have seen a pain physician (40% vs. 33%), and reported more visits to



* Significant difference in reported utilization between diagnosis groups. (p<0.05)
¹ Alternative health care providers/therapies, including acupuncture, homeopathic, osteopathic, psychotherapy.
² Passive modalities include education, passive PT, activity restriction, devices.

Figure 2. Healthcare utilization before enrollment in SPORT, by diagnosis.

medical specialists (88% *vs.* 82%) and physical therapists (69% *vs.* 61%) (Table 2). With regard to medication use, females used significantly more antidepressants and muscle relaxants (32% *vs.* 18%), as well as more OTC medications (27% *vs.* 20%). Males were more likely not to have used any medication (16% *vs.* 10%).

Race. The breakdown into racial groups shows while some differences among groups achieved statistical significance, no group was consistently high or low in health care utilization compared to the other groups. Because of the small number of racial minorities enrolled in SPORT, differences of similar magnitude that were statistically significant for other sociodemographic variables were not statistically significant for race.

Education. Overall, the analysis of the patients based on level of education shows similar rates of usage of health-care providers and treatment methods at all educational levels. However, patients with lower levels of education had received significantly more opiate pain medication (less than high school, 48%; *vs.* postgraduate degree, 27%), while patients with graduate degrees had used significantly less opiate pain medication compared with all other groups (Table 2).

Type of Insurance

Chiropractic use. Finally, analysis of patients based on type of insurance indicates that patients with no insurance and those with employer insurance were more likely to have visited and received treatment from a chiropractor (47% and 39%) compared with patients with other forms of insurance (*e.g.*, 26% Medicare, 33% Medicaid, and 32% private) (Table 2).

ED. Medicaid patients had significantly more visits to the ED (31%) compared with patients with all other insurance types (22% no insurance, 16% employer, 3% Medicare, 11% private) (Table 2).

Medications. Medicaid patients also used significantly more opiate medication compared with all other patients (58% *vs.* 41% no insurance, 42% employer, 33% Medicare, and 32% private), and there was also a trend toward more usage of antidepressant and muscle relaxant medication in the Medicaid group. Medicare and private insurance patients used significantly more OTC medication compared with the other insurance groups (32% and 29% *vs.* 22% no insurance, 21% employer, and 22% Medicaid) (Table 2).

Adjusted Results

Adjusted analysis allowed us to observe that patients over 60 years old are still twice as likely to use OTC medications as patients under 40 (32% *vs.* 16%, $P = 0.003$), even after controlling for diagnosis and other covariates (Table 3). In the adjusted analysis, age was no longer a significant predictor of chiropractic care, ED visits, opiates, or antidepressant usage. Similarly, after

controlling for covariates, the adjusted proportion of females using certain medications was significantly higher than that of men (42% *vs.* 34% using opiates, $P = 0.005$; 31% *vs.* 17% using antidepressants, $P < 0.001$; and 25% *vs.* 20% using OTC medications, $P = 0.038$), but gender was no longer significantly related to chiropractic or ED use.

The adjusted analysis confirms that IDH patients had visited the ED and used opiates and antidepressants more often than SpS and DS patients ($P < 0.001$ for ED and opiate use, $P = 0.038$ for antidepressant use), and that chiropractic use varied significantly across the three diagnostic groups (IDH 38%, SpS 28%, and DS 22%, $P = 0.001$). However, significant differences across these three groups in the use of injections and OTC medications disappeared after adjustment. Education continues to show close association with the use of opiates. Fifty-two percent of patients having little formal education had used opiate medications compared with only 28% of patients with a postgraduate degree ($P < 0.004$). Race was associated with opiate use, with whites having significantly more utilization than minorities (adjusted rate: 39% whites compared with 29% blacks and 14% Asians, $P = 0.022$); however, race was no longer associated with ED visits.

Finally, after adjusting for covariates, Medicaid patients remained the most frequent users of emergency departments, with nearly double the rate of patients with any other type of insurance ($P = 0.033$). Medicaid patients showed the highest adjusted rate of opiate use (61%), with Medicare patients following close behind (50%, $P = 0.005$). Insurance status, in and of itself, did not predict utilization of chiropractic or OTC medications after adjusting for covariates. However, Workers' Compensation patients showed adjusted utilization rates of opiates and antidepressants nearly 50% higher than noncompensation patients ($P < 0.001$ and $P = 0.022$, respectively).

Discussion

Greater than 250,000 surgeries on the lumbar spine are performed electively each year in the United States,¹⁸ with procedures for IDH, SpS, and DS being the most common.⁴ The data from this study provide prospective information on the characteristics of patients with confirmed clinical and radiographic findings of IDH, SpS, and DS. We also provide important information about their prior utilization of health care at the time they enrolled in SPORT. The data presented in this paper represent a broad population base from 13 centers in 11 states, comprising 8 academic centers and 5 private practices. Each practice has many participating physicians (surgeons [orthopedic and neurosurgery] and nonsurgeons) from various disciplines that tend to see these kinds of patients.

Table 2. Healthcare Utilization Prior to Enrollment in SPORT, by Age, Gender, Race, and Insurance Provider

	Age (yr)			<i>P</i>	Gender			<i>P</i>	Race				<i>P</i>
	<40	40–60	60+		Female	Male	White		Black	Asian	Other/ Mixed		
N	378	557	482		687	730		1204	107	12	51		
Providers													
Alternative	26%	26%	23%	0.32	29%	21%	<0.001	25%	22%	25%	24%	0.92	
Anesthesia/pain	31%	36%	41%	0.017	40%	33%	0.006	37%	33%	8%	41%	0.014	
Chiropractic/manipulation	40%	41%	28%	<0.001	35%	37%	0.52	38%	20%	42%	27%	0.001	
Emergency department	22%	16%	5%	<0.001	15%	13%	0.39	13%	21%	25%	8%	0.051	
Medical (family, internist, neurologic, rheumatic)	84%	84%	87%	0.48	88%	82%	0.005	85%	93%	100%	75%	0.01	
Surgeon	88%	85%	84%	0.14	85%	86%	0.57	85%	85%	83%	90%	0.81	
Physical therapist	69%	66%	59%	0.01	68%	61%	0.004	65%	65%	75%	63%	0.88	
None	1%	0%	0%	0.24	0%	0%	0.6	0%	0%	0%	0%	0.94	
Treatments													
Passive modalities	92%	90%	88%	0.13	91%	89%	0.12	90%	90%	92%	92%	0.95	
Physical therapy	76%	72%	66%	0.003	75%	67%	0.001	71%	72%	67%	65%	0.76	
Chiropractic/manipulation	38%	34%	25%	<0.001	31%	33%	0.66	34%	18%	42%	25%	0.005	
Injections	50%	54%	56%	0.22	56%	51%	0.077	53%	56%	42%	57%	0.76	
Alternative	14%	15%	13%	0.79	15%	12%	0.1	14%	13%	25%	14%	0.73	
None	1%	0%	1%	0.37	0%	1%	0.21	1%	1%	0%	0%	0.91	
Medications													
Anti-inflammatory	60%	57%	54%	0.23	59%	55%	0.27	57%	63%	67%	55%	0.062	
Narcotics	50%	42%	28%	<0.001	42%	37%	0.11	40%	34%	17%	41%	0.25	
Antidepressants/muscle relaxants	26%	30%	19%	<0.001	32%	18%	<0.001	24%	32%	8%	27%	0.17	
OTC/alternative	16%	22%	33%	<0.001	27%	21%	0.002	24%	28%	8%	22%	0.42	
None	11%	11%	18%	0.004	10%	16%	0.002	13%	12%	25%	16%	0.61	

Table 3. Adjusted Proportion of Patients in Each Subcategory Who Received Treatment (Multiple Logistic Regression Analysis Results)

Characteristic	Category	Chiropractor		ED		Injections		Opiates		Antidepressants		OTC Meds	
		(%)	<i>P</i>	(%)	<i>P</i>	(%)	<i>P</i>	(%)	<i>P</i>	(%)	<i>P</i>		
Age	<40 yr	32	0.88	12	0.29	52	0.81	43	0.074	23	0.073	16	0.003
	40–60 yr	33		11		53		41		27		21	
	>60 yr	31		7		56		31		19		32	
Gender	Male	31	0.57	9	0.058	51	0.061	34	0.005	17	<0.001	20	0.038
	Female	33		12		56		42		31		25	
Diagnosis	IDH	38	0.001	17	<0.001	51	0.45	47	<0.001	27	0.038	24	0.79
	SPS	28		7		56		30		19		21	
	DS	22		4		56		28		19		22	
Education	<High school	29	0.7	11	0.53	49	0.17	52	0.004	25	0.13	19	0.76
	High school	34		13		55		43		21		23	
	Some college	33		10		54		39		26		23	
	College graduate	32		8		56		39		26		22	
	Post-graduate degree	29		9		50		28		19		24	
Race	White	33	0.052	10	0.2	54	0.088	39	0.022	23	0.078	23	0.51
	Black	18		16		54		29		29		26	
	Asian	40		16		46		14		7		10	
	Other/mixed	28		7		57		42		28		20	
Insurance	Employer	33	0.44	10	0.033	55	0.17	35	0.005	22	0.85	23	0.87
	Medicare	26		5		46		50		26		22	
	Medicaid	29		25		48		61		29		21	
	Private	31		13		56		38		23		25	
	None	44		9		64		27		23		29	
Compensation*	No compensation	32	0.48	9	0.091	53	0.32	36	<0.001	22	0.022	23	0.35
	Compensation	29		13		57		51		30		20	
Episode	<6 mo	29	0.027	10	0.37	51	0.041	39	0.47	22	0.37	21	0.11
	6–12 mo	37		8		57		38		24		23	
	1 yr or more	36		12		59		35		27		28	

*Defined as having applied to, or currently receiving payments from, Worker's Compensation, Social Security Disability Insurance, or any other disability insurance programs for a spine-related problem.

Table 2. Continued

Education					P	Insurance					P
Less Than High School	High School Graduate	Some College	College Graduate	Postgraduate Degree		None	Employer	Medicare	Medicaid	Private	
66	50	351	356	292		32	909	219	36	214	
23%	23%	24%	29%	26%	0.34	25%	26%	22%	31%	24%	0.74
35%	40%	36%	34%	37%	0.66	41%	34%	41%	39%	42%	0.14
29%	38%	39%	38%	32%	0.21	47%	39%	26%	33%	32%	0.002
12%	17%	14%	13%	10%	0.12	22%	16%	3%	31%	11%	<0.001
89%	86%	85%	85%	85%	0.88	78%	85%	88%	86%	82%	0.36
86%	86%	85%	87%	86%	0.96	81%	85%	87%	86%	86%	0.92
52%	62%	66%	69%	65%	0.055	78%	66%	58%	75%	61%	0.033
0%	0%	0%	0%	1%	0.32	0%	0%	0%	0%	1%	0.18
91%	89%	91%	91%	88%	0.061	88%	90%	89%	94%	88%	0.68
64%	67%	74%	75%	69%	0.094	78%	73%	65%	75%	67%	0.12
24%	33%	33%	34%	29%	0.42	44%	35%	23%	25%	29%	0.004
55%	56%	54%	53%	49%	0.5	63%	53%	51%	56%	57%	0.6
12%	12%	13%	15%	17%	0.32	9%	14%	16%	17%	14%	0.85
2%	0%	1%	0%	1%	0.15	3%	0%	1%	0%	1%	0.35
58%	55%	58%	59%	56%	0.93	50%	59%	54%	61%	54%	0.45
48%	44%	40%	42%	27%	<0.001	41%	42%	33%	58%	32%	0.003
27%	24%	28%	27%	18%	0.042	28%	27%	21%	36%	20%	0.082
23%	25%	25%	21%	25%	0.73	22%	21%	32%	22%	29%	0.002
11%	13%	11%	13%	17%	0.13	19%	11%	17%	8%	19%	0.008

The gender breakdown of this study population shows a greater use of antidepressants among females, as well as a trend toward more treatment in general from all healthcare providers. Women also reported greater pain at baseline on the SF-36 BP scale (24 vs. 28; $P = 0.004$ data not shown). These findings are consistent with gender differences seen in the general population as regards general healthcare utilization,¹⁹ with females using healthcare resources more than males. The female population also used significantly more opiate medications than men. This may be related to increased affective distress (as seen with the increase in antidepressant use)²⁰ and variations in pain perception that have been reported for many conditions, including chronic low back pain.^{21,22}

The analysis of patients by insurance type presents some interesting findings. Medicaid patients were much more likely to have visited an ED and to have received opiates. This remained true even after controlling for multiple covariates, including education level, which also was an independent predictor of opiate use. These findings are consistent with prior reports of increased ED visits from patients with Medicaid insurance due to difficulty with access to primary care.²³ As reimbursements to primary care providers continue to decrease, they become less willing to see Medicaid patients in their practice. This effectively shifts the care of nonemergency medical problems of these patients to the ED. These findings appear to emphasize the need for access to primary care for low income patients in order to improve compliance with recommended treatment guidelines and potentially decrease total cost of health care for these patients.

Despite the variation in treatments received by patients for the different diagnostic and demographic groups, available evidence does not demonstrate that one treatment is more beneficial than another. With no clear consensus in place, it is difficult to discern if the differences in treatment that are seen are due to provider recommendation, patient preference, or other factors within the healthcare system.

The results from this study have the advantage of coming from a variety of centers with a large number of patients in the study. However, all the patients in these three cohorts represent those who refused to be randomized in SPORT. This might select for patients with more severe symptoms, or other factors such as patient preferences, understanding risks or aversion to chance. Follow-up comparisons with the SPORT randomized patients will be important to see whether there are any important differences between these two groups.

SPORT represents the largest cooperative multicenter, multidisciplinary study that has been undertaken for these three diagnostic groups (IDH, SpS, DS). Reporting the baseline data for the observational cohort will allow others to have a clear picture of the patients studied and how those patients relate to the practices of surgeons and nonsurgeons alike. The literature is replete with studies that provide minimal information regarding the baseline characteristics of the population studied. To be compatible with the CONSORT publication recommendations,²⁴⁻²⁶ SPORT baseline data are presented here for future reference when reporting our results at 1 year and beyond. Results

from most studies leave the reader wondering if the results are applicable to their practice and patient population. Because SPORT involves 11 states, 13 centers, and 115 physicians representing 6 medical specialties (general internal medicine, anesthesiology, rheumatology, occupational medicine, physiatry, rehabilitation medicine) and 2 surgical disciplines (orthopedics and neurosurgery), these comprehensive data are the most generalizable published to date.

The data presented provide prospective baseline information on the three most common diagnostic groups of patients for which lumbar spine surgery is performed: IDH, SpS, and DS. Understanding the baseline patient characteristics, function, treatments sought, and variability of treatment frequencies in different subgroups is important in planning future treatments. Recognizing the potential differences in race, gender, educational level, insurance type, and other factors may be important in predicting short- and long-term effectiveness of the treatments these patients receive. In analyzing the SPORT outcomes, we will be able to consider the effects of these variables and better understand their role in the results of subsequent treatments. With this extensive collection of baseline information, we will be prepared to evaluate the outcomes of different treatments among different subgroups with the same diagnosis, determining if those outcomes are related to baseline patient variability.

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This study is dedicated to the memory of Brianna Weinstein.

■ Key Points

- Baseline data on the observational cohort of the Spine Patient Outcomes Research Trial (SPORT) are presented. Three diagnostic groups (IDH, SpS, and DS) are covered.
- Understanding subgroup baseline function, treatments sought, and variability of treatment frequencies is important to identify potential treatment biases related to race, gender, insurance type, or other factors.
- Medicaid patient resource utilization is different from all other groups independent of diagnosis.

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