

What Is Different About Worker's Compensation Patients?

Socioeconomic Predictors of Baseline Disability Status Among Patients With Lumbar Radiculopathy

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Study Design. Combined analysis of 2 prospective clinical studies.

Objective. To identify socioeconomic characteristics associated with workers' compensation in patients with an intervertebral disc herniation (IDH) or spinal stenosis (SpS).

Summary of Background Data. Few studies have compared socioeconomic differences between those receiving or not receiving workers' compensation with the same underlying clinical conditions.

Methods. Patients were identified from the Spine Patient Outcomes Research Trial (SPORT) and the National Spine Network (NSN) practice-based outcomes study. Patients with IDH and SpS within NSN were identified satisfying SPORT eligibility criteria. Information on disability and work status at baseline evaluation was used to categorize patients into 3 groups: workers' compensation, other disability compensation, or work-eligible controls. Enrollment rates of patients with disability in a clinical efficacy trial (SPORT) and practice-based network (NSN) were compared. Independent socioeconomic predictors of baseline workers' compensation status were identified in multivariate logistic regression models controlling for clinical condition, study cohort, and initial treatment designation.

Results. Among 3759 eligible patients (1480 in SPORT and 2279 in NSN), 564 (15%) were receiving workers' compensation, 317 (8%) were receiving other disability compensation, and 2878 (77%) were controls. Patients receiving workers' compensation were less common in SPORT than NSN (9.2% vs. 18.8%, $P < 0.001$), but patients receiving other disability compensation were similarly represented (8.9% vs. 7.7%, $P = 0.19$). In univariate analyses, many socioeconomic characteristics significantly differed according to baseline workers' compensation status. In multiple logistic regression analyses, gender,

educational level, work characteristics, legal action, and expectations about ability to work without surgery were independently associated with receiving workers' compensation.

Conclusion. Clinical trials involving conditions commonly seen in patients with workers' compensation may need special efforts to ensure adequate representation. Socioeconomic characteristics markedly differed between patients receiving and not receiving workers' compensation. Identifying the independent effects of workers' compensation on outcomes will require controlling for these baseline characteristics and other clinical features associated with disability status.

Key words: workers' compensation, disability, lumbar disc herniation, sciatica, spinal stenosis, predictors. **Spine 2007;32:2019–2026**

In working-age populations, sciatica due to an intervertebral disc herniation (IDH) is a common cause of low back problems resulting in disability. Among older persons in an aging workforce, spinal stenosis (SpS) is the most common cause of low back pain with radicular leg pain. For patients with these radicular pain syndromes, surgical treatment is frequently considered for persistent or severe symptoms. More than 400,000 nonfusion spine operations are performed each year in the United States, with discectomy for an IDH being the most common procedure.^{1,2} Although spine surgery is less common in older individuals, rates are rapidly increasing with SpS being the most common diagnosis.³ Despite being common conditions in working-age individuals, the extent to which treatment influences work-related disability is poorly understood.

There is a widespread belief that patients receiving disability compensation have inferior clinical outcomes. For example, Harris *et al* examined surgical outcomes of patients with and without workers' compensation (WC) for a variety of indications including back pain.⁴ Results from 129 studies involving 20,498 patients reported inferior outcomes for those individuals receiving WC.⁴ Often these outcomes are attributed to secondary gain, implying that the patient may be partly to blame. However, few studies adequately control for differences in clinical and demographic characteristics that may be related to outcomes and disability status.⁵ Harris *et al* identified many study limitations, including retrospective study design, use of unvalidated outcome measures, nonblinded physician reporting, and heterogeneous, poorly characterized clinical disorders.⁴ In addition, most studies were

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not designed to assess the impact of disability compensation status, and few controlled for baseline differences between patients receiving disability compensation or not.^{4,6–10}

Differences in treatment outcomes for those receiving disability compensation might be explained by both clinical and nonclinical factors.¹¹ Clinical factors can include potential differences in the disease entity itself, its severity, the presence of other medical conditions, and treatment(s) received.^{12–15} Nonclinical factors can include patient demographic, economic, work-related, and expectation/preference characteristics.^{13,16–20} Prior studies have identified many differences in clinical and nonclinical factors among patients who were receiving and not receiving WC at baseline.^{21–23} However, whether these results are generalizable is not clear since most involved a single institution or state, and WC is a state-based program with rules that vary considerably across the United States.

This study seeks to address many of these limitations by examining baseline data for patients with disability compensation due to homogeneous, objectively defined spine conditions that were prospectively identified and evaluated at sites in different states. The goal is to identify baseline socioeconomic characteristics of patients with WC at study enrollment that distinguish them from patients who are not receiving disability compensation.

Materials and Methods

The study involved analyses using 2, well-described data sources: the Spine Patient Outcomes Research Trial (SPORT), and the National Spine Network (NSN). SPORT is a prospective trial with observational and randomized cohorts of patients with IDH, SpS, and degenerative spondylolisthesis (DS) enrolled at multiple centers.^{24–26} The NSN includes 28 spine centers that prospectively collected data on patients seen for a wide range of spine problems.^{27,28} The current study sought to identify patients with the same lumbar spine disorders in the SPORT and NSN data sets who reported they were receiving or applying for disability compensation due to their back problem (excluding patients already permanently disabled), and to compare them with patients in the workforce not receiving or applying for disability compensation (work-eligible comparison group). This study combined data from both sources because survey instruments included many similar variables. By merging data from patients with lumbar radiculopathy due to an IDH or SpS who were categorized according to initial disability and work status, the goal was to identify a large, multistate cohort of patients receiving disability compensation or not with well-described homogeneous clinical conditions. All patients enrolled in NSN and SPORT provided written informed consent at the time of study enrollment, and all study activities were approved by institutional review boards at participating institutions.

Study Population. Broadly, eligibility for the current study involved categorizing patients in SPORT and NSN according to 1) criteria for lumbar radiculopathy due to an IDH or SpS with or without DS, 2) disability status at study enrollment, and 3) work status at study enrollment. All patients meeting clinical eligibility criteria who were either receiving disability

compensation at study enrollment or were classified as work-eligible were selected.

Eligibility Criteria for Lumbar Radiculopathy. Study eligibility with respect to the clinical spine condition was based on inclusion and exclusion criteria for patients enrolled in SPORT. Patients were eligible if they had appropriate symptoms and examination findings confirmed on advanced imaging studies for each of the 3 radicular syndromes, IDH, SpS, and DS. Exclusion criteria for all 3 diagnostic categories were designed to restrict enrollment to patients without prior spine surgery for whom surgery would be appropriate, elective, and acceptably safe (Figure 1). Patients in SPORT were enrolled between 2000 and 2005.

Since NSN enrolled patients with a wide range of spine conditions, eligibility criteria were developed to mirror SPORT. A comparison of eligibility criteria for SPORT and NSN populations are shown in Figure 1. Exclusion criteria in SPORT without comparable variables in NSN were generally limited to factors necessary for a clinical trial comparing surgical and nonoperative treatment outcomes. As such, the criteria for NSN patients may better reflect clinical practice at these sites. A total of 4858 patients with IDH and 3445 patients with SpS enrolled between 1998 and 2003 were identified. Applying the criteria in Figure 1, 2294 (47.2%) patients with IDH and 1712 (49.7%) with SpS were excluded.

Disability Status at Study Enrollment. Patients were classified according to self-reported disability compensation status at study enrollment (baseline).²¹ Programs assessed included WC, Social Security Disability Insurance (SSDI), and other disability compensation (ODC) insurance. Since SSDI reflects a permanent disability state, patients receiving SSDI at enrollment were excluded. Response categories and disability status criteria are

SPORT Eligibility Criteria	NSN
Inclusion	
Spine condition (IDH, SpS, DS)	✓
Age 18 or older	✓
Radicular pain	✓
Exam evidence of nerve compression	✓-
Advanced imaging confirms diagnosis	✓-
Exclusion	
Prior spine surgery	✓
Duration of symptoms (IDH >6 weeks, SpS or DS >12 weeks)	✓-
Active cancer	✓
Current fracture, infection, significant deformity	✓
Cauda equina syndrome or progressive neurologic deficit	✗
Dramatic improvement with non-surgical care	✗
Possible pregnancy	✗
Enrollment in another spine trial	✗
Not available for follow-up or unable to complete questionnaires	✗
Overall health makes surgery inappropriate	✗

Figure 1. Eligibility criteria for SPORT and comparison to NSN. ✓, comparable variable in NSN; ✓-, similar variable in NSN; ✗, no comparable variable available in NSN; IDH, intervertebral disc herniation; SpS, spinal stenosis; DS, degenerative spondylolisthesis.

SPORT Responses	NSN Responses
Receiving Workers' Compensation	
Yes	
Receiving	Receiving
Pending	Applied for it
Under appeal	
No	
Rejected	
In the past	Used to receive
	Planning to apply
Work Eligible Comparison Group	
Yes	
Working full-time (≥35 hours)	Currently working
Working part-time (<35 hours)	
Without a job / Not working	On leave of absence
Unemployed, laid off, looking for work	Unemployed
No	
Disabled and unable to work	Disabled due to ill health
Retired	Retired
Homemaker/keeping house	Homemaker
Other	Other

Figure 2. Comparison of disability and work status criteria in SPORT and NSN at study enrollment.

shown in Figure 2. Since patients could respond affirmatively to 1 or more disability programs, patients were considered to be receiving disability if they reported an approved or pending application.

Although patient-reported disability compensation status has been previously validated,²¹ we compared patient-reported disability status responses to billing records for the subset of eligible patients enrolled at 1 site enrolling patients in SPORT and NSN (total 981 patients: 813 only in NSN, 69 only in SPORT, and 99 in both SPORT and NSN). The payer source for all clinical visits during a period of 2 years before and after the study enrollment date was obtained. Billing data were considered to agree with patient response if there was any payment by WC for those reporting WC and no payment by WC for those not reporting WC. Disagreement was defined as patient and billing records reporting differences for WC status or if the billing record information was missing. Among patients reporting applying for or receiving WC, 148 of 167 (88.6%) had local billing information indicating payment by WC. Thirteen of 19 where patient and billing information differed represented patients who stated they had applied for WC. Among 814 patients reporting not currently receiving or applying for WC, 761 (93.5%) had no billing records indicating payment from WC. Of the 53 patients who reported they had not applied for or were receiving WC but had billing records of WC payments, 15 (28.3%) stated that had received WC in the past but were no longer receiving it, and 10 (18.9%) said they were planning to apply for WC. Agreement for the total validation population was good (kappa = 0.76), and ranged from 0.75 to 0.88 among NSN and SPORT patients.

Work Status at Study Enrollment. To create an appropriate comparison group for patients identified as receiving disability compensation, patients not classified as WC or ODC but who

could have a future work-related disability were identified. This was accomplished by classifying patients according to self-reported work status at study enrollment. Response categories and work status criteria are shown in Figure 2. Patients were “work- eligible” if they were 1) currently working, 2) not working because of back problems, or 3) unemployed (since they could return to work after finding a new job). Patients were excluded if they reported they were retired, disabled from another condition, were a homemaker or student, or if they did not report their employment status.

Initial Treatment Designation. Treatment status was categorized at baseline as surgical or nonoperative based on treatment assignment or choice. For patients enrolled in SPORT, treatment assignment was based on participation in the randomized controlled trials or an observational cohort. Patients agreeing to randomization received their treatment assignment, surgical or nonoperative, at the time of study enrollment. Patients not choosing to be randomized but agreeing to participate in the observational cohort study designated their treatment choice at the time of study enrollment. Since NSN was not designed as a clinical trial, no formal treatment assignment or designation was required at study enrollment. Therefore, initial treatment designation for this study was based on the evaluating physician reporting that surgery was “recommended” or “scheduled” for a patient at baseline.

Baseline Assessment. All patients completed baseline questionnaires at the time of study enrollment. Participating investigators also provided baseline clinical information. Patients reported a broad range of socioeconomic information. Because the goal of this study is to compare nonclinical factors that differentiate patients receiving WC or not, domains considered in this analysis include demographic information, disability status, work status, economic information, and expectations for treatment. Other domains representing clinical baseline status that are available in these data sets will be evaluated in future analyses.

For each socioeconomic domain, baseline variables from the SPORT and NSN were assessed, including their response categories. Mapping of variables and responses among the 2 data sources was performed (see Appendix, available online through Article Plus). In general, most variables in NSN were available in the SPORT data set, but as a major clinical trial, SPORT collected additional variables not included in the NSN survey questionnaires. For example, more detailed information about work status, income sources, and treatment expectations/preferences were available in SPORT.

Analysis. Baseline variables were compared for patients in WC and work-eligible comparison groups. Initial analyses compared responses by WC status separately according to data source (SPORT or NSN), clinical cohort (IDH or SpS), and initial treatment (surgical or nonoperative). Since findings were similar for those in WC and work-eligible groups, the combined population was used with all comparisons controlling for data source, clinical cohort, and initial treatment. Although SPORT enrolled patients with SpS and DS into separate treatment cohorts, this study merged these patients into 1 group since the underlying process is degenerative and the population represents older working individuals. For baseline variables

that were only available in the SPORT data set, adjusted comparisons controlled for clinical cohort, initial treatment, and study cohort (randomized or observational).

χ^2 tests were used to compare the percentage of work-eligible patients with WC and ODC according to 1) data source (SPORT or NSN), 2) clinical cohort (IDH or SpS/DS), 3) initial treatment designation (surgical or nonoperative), and 4) for SPORT patients, study cohort (randomized or observational). To identify baseline variables independently associated with WC status, preliminary selection from each of the 5 socioeconomic domains was separately performed using stepwise multiple logistic regression models developed with a *P* value threshold of 0.1 for entry and 0.05 for retention. Variables meeting these criteria were then entered into new models using the same criteria. Separate models were created for combined and SPORT only data sets. Association among baseline variables and WC status (the dependent variable) are reported as odds ratios and 95% confidence intervals. All statistical analyses were performed using a commercial software package (Statistical Analysis System, SAS Institute, Cary, NC).

Results

Among patients enrolled in NSN, 2564 with a lumbar IDH and 1733 with lumbar SpS met eligibility criteria. In SPORT, 1247 patients with a lumbar IDH and 1265 patients with SpS were enrolled. A total of 127 eligible patients were separately enrolled in both SPORT and NSN, and these individuals were excluded from the NSN population. Among SPORT and NSN patients with IDH or SpS, disability and work status assessment led to the exclusion of patients already receiving SSDI (*n* = 221), missing disability information (*n* = 469), and not being work-eligible (*n* = 2233).

A final study population of 3759 eligible patients was identified, 1480 (39%) enrolled at 13 SPORT sites (1–199 patients per site) and 2279 (61%) enrolled at 21 NSN sites (2–813 patients per site). Eleven sites enrolled patients in both SPORT and NSN. Disability compensation status among eligible patients at baseline assessment included 564 patients (15%) with WC, 317 (8%) with other disability compensation (ODC), and 2878 (77%) in the work-eligible comparison group (Table 1). WC patients were much more likely to have been enrolled in NSN than SPORT (18.8% *vs.* 9.2%, *P* = < 0.001), but patients receiving ODC were equally likely to have been enrolled in the 2 studies (8.9% *vs.* 7.7%, *P* = 0.19). These results were unchanged when only patients enrolled at sites contributing to both NSN and SPORT were considered (17.0% *vs.* 9.2%, *P* < 0.001, for WC patients). However, among patients enrolled in SPORT, disability compensation patients (WC and ODC) were equally likely to have been included in the randomized control trials (Table 1). The percentage of patients selecting initial surgical treatment were similar comparing WC to those work-eligible, but ODC patients were more likely to designate surgical treatment (9.9% ODC *vs.* 7.3% work-eligible, *P* = 0.006).

Table 1. Disability Compensation Status by Study Cohort, Clinical Condition, and Initial Treatment Status

Cohort/Condition/ Treatment	N	Disability Compensation Status			
		WC (%)	<i>P</i> *	ODC (%)	<i>P</i> *
Total population	3759	564 (15.0)	—	317 (8.4)	—
NSN	2279	428 (18.8)	<0.001	203 (8.9)	0.19
SPORT	1480	136 (9.2)		114 (7.7)	
Randomized	624	54 (8.7)	0.54	48 (7.7)	0.99
Observational	856	82 (9.6)		66 (7.7)	
Clinical condition					
Disc herniation	2760	489 (17.7)	<0.001	235 (8.5)	0.77
Spinal stenosis	999	75 (7.5)		82 (8.2)	
Initial treatment status					
Surgical	1632	253 (15.5)	0.45	161 (9.9)	0.006
Nonoperative	2127	311 (14.6)		156 (7.3)	

**P* values compare the percentage of disability compensation patients among cohorts, clinical conditions, and initial treatment groups using χ^2 tests.

Differences in Socioeconomic Characteristics by Baseline Workers' Compensation Status

Socioeconomic variables in both SPORT and NSN data sets were compared for patients receiving WC and those in the work-eligible comparison group (Table 2). There were significant differences in patient-reported socioeconomic variables, including demographic characteristics and work history (Table 2). Patients receiving WC were younger, and more likely to be male, nonwhite, less educated, and smokers. Although patients receiving WC worked fewer weeks in the prior year, they usually worked more hours per week and reported more physically demanding activities than patients not receiving WC. Prior disability claims were uncommon and similar among those receiving WC or not (data not shown), but WC patients were much more likely to have retained an attorney.

Additional socioeconomic variables only available for patients in SPORT provide more information about work and economic status, and preferences and expectations (Table 3). Patients receiving WC were much less likely to work as a manager or professional. Financial variables differed markedly for patients receiving WC. Patients receiving WC reported lower annual income and had fewer additional sources of income. They required more financial assistance from others and had depleted more of their financial reserves because of their current back problem (Table 3). Expectations for surgical and nonoperative treatment also differed based on disability status. Patients receiving WC were much less likely to expect to be able to return to their usual job regardless of treatment. Treatment preferences also differed, with patients receiving WC more likely to feel that surgery was needed.

Independent Socioeconomic Predictors of Baseline Workers' Compensation Status

To identify socioeconomic factors that were independently associated with baseline WC status, multiple logistic regression modeling was separately performed for variables from combined SPORT and NSN data sets (Table 4) as well as only patients from SPORT (Table 5). Socioeconomic variables from the combined data sets

Table 2. Baseline Patient Characteristics Associated With Workers' Compensation Status for Patients in SPORT and NSN

Variable	WC (N = 564) [N (%)]	Work-Eligible (N = 2878) [N (%)]	P*
Age in years, mean (SD)	41 (10)	46 (13)	<0.001
Gender, female	155 (27)	1222 (42)	<0.001
Ethnicity			0.009
White	469 (83)	2514 (87)	
Hispanic	9 (2)	28 (1)	
Black	27 (5)	140 (5)	
Other/mixed	59 (10)	196 (7)	
Education			<0.001
Less than high school	64 (12)	106 (4)	
High school or some college	384 (72)	1343 (48)	
College graduate	89 (17)	1351 (48)	
Marital status, married/ significant other	371 (66)	2051 (71)	0.021
Body mass index (kg/m ²), [mean (SD)]	28.1 (5.1)	27.9 (5.2)	0.003
Smoking or recently quit	265 (47)	699 (24)	<0.001
Usual work hours/wk			0.003
≥40 hr	444 (81)	2023 (72)	
30–39 hr	51 (9)	377 (14)	
<30 hr	53 (10)	392 (14)	
Work weeks in past year†			<0.001
46–52 wk	243 (45)	2455 (86)	
31–45 wk	185 (34)	264 (9)	
15–30 wk	63 (12)	58 (2)	
<15 wk	52 (10)	85 (3)	
Physical requirements of daily responsibilities‡			<0.001
Extremely strenuous	227 (41)	348 (12)	
Moderately strenuous	245 (45)	1254 (45)	
A little/not strenuous	77 (14)	1198 (43)	
Legal/attorney action pending or resolved	197 (39)	154 (6)	<0.001
Very dissatisfied with current state	483 (86)	2220 (78)	0.002

*P values compare workers' compensation (WC) and work-eligible patients using logistic regression models that control for study cohort (IDH and SpS), data source (SPORT and NSN), and initial treatment (surgical and non-operative).

†Smoking or quit within 1 year (SPORT patients) or 6 months (NSN patients).

‡For NSN patients, derived calculating the time between the "date stopped working" and the "date returned to work." Combined "work status" and "work loss dates" questions to identify the "no-work-loss" group.

§For SPORT patients, derived from 4 questions about the importance of duties related to occupation or homemaking duties including lifting, standing, walking/climbing stairs, and driving. Considered extremely strenuous if responded "very important" to all 4 questions, a little/not strenuous if any question response "not important," and moderately strenuous for other responses.

Table 3. Additional Baseline Patient Characteristics Associated With Workers' Compensation Status Only Available for Patients in SPORT

Variable	WC (n = 136) [N (%)]	Work-Eligible (N = 1230) [N (%)]	P*
Occupation, manager or professional	22 (16)	742 (61)	<0.001
Missed work in past month, >1 day	92 (77)	239 (20)	<0.001
Employer changed your job, Yes	24 (20)	223 (19)	0.79
Prefer fewer hrs w/less pay, Yes	14 (11)	183 (15)	0.22
Importance of lifting weight, Not important of standing for long time, Not	15 (11)	638 (52)	<0.001
Importance of walking stairs, Not	11 (8)	336 (27)	<0.001
Importance of driving a car, Not	21 (15)	275 (22)	0.07
Annual income			<0.001
>\$50,000	37 (28)	548 (45)	
Not working or <\$50,000	95 (71)	575 (47)	
Refused to answer/not sure	2 (1)	104 (8)	
Other sources of income			0.02
Yes	64 (48)	762 (62)	
No	64 (48)	433 (35)	
Refused to answer	6 (4)	32 (3)	
Other financial assistance			<0.001
Yes	27 (20)	63 (5)	
No	102 (76)	1142 (93)	
Refused to answer	5 (4)	24 (2)	
Depleted financial resources			<0.001
Yes	63 (48)	165 (13)	
No	65 (49)	1037 (84)	
Refused to answer	4 (3)	26 (2)	
Free of symptoms with surgery			0.01
No, small chance	14 (10)	63 (5)	
Moderate chance	35 (26)	365 (30)	
Big chance, certain	87 (64)	781 (65)	
Free of symptoms without surgery			0.55
No, small chance	76 (56)	605 (50)	
Moderate chance	37 (27)	413 (34)	
Big chance, certain	22 (16)	194 (16)	
Work at usual job with surgery			<0.001
No, small chance	24 (17)	76 (6)	
Moderate chance	29 (21)	242 (20)	
Big chance, certain	82 (61)	897 (74)	
Work at usual job without surgery			<0.001
No, small chance	92 (68)	367 (30)	
Moderate chance	21 (15)	419 (34)	
Big chance, certain	23 (17)	432 (35)	
Treatment preference, pre-enrollment			<0.001
Definitely-probably no surgery	24 (18)	424 (35)	
Not sure	33 (24)	326 (27)	
Probably, definitely surgery	79 (58)	472 (39)	

*P values compare workers' compensation (WC) and work-eligible patients using logistic regression models that control for study cohort (IDH and SpS), treatment cohort (RCT and OBS), and initial treatment (surgical and non-operative).

independently associated with WC included male gender, less education, longer usual work hours, fewer weeks worked in the last year, more physically strenuous activities, and legal action taken (Table 4).

For analyses limited to eligible patients enrolled only in SPORT (Table 5), gender, physically demanding activities (lifting weight), and legal action taken were again associated with WC status. Additional independent variables included not wanting to work fewer hours, not being a manager or professional, missed work days in the past month, having depleted financial resources, and feeling less likely to be able to work at their usual job without surgery.

Subgroup analyses limited to patients receiving WC (excluding those reporting pending or appealed applications) examined the independent predictors identified in Tables 4 and 5. No major differences in adjusted odds ratios were identified among variables, although 1 variable in each model was no longer statistically significant: gender in combined NSN and SPORT population models (odds ratio = 0.77; 95% confidence interval, 0.5–1.1, P = 0.12) and legal/attorney action in the SPORT only

Table 4. Factors Associated With Baseline Workers' Compensation Status for Patients in SPORT and NSN

Variable	Odds Ratio	95% CI	P*
Gender			0.002
Female	0.64	0.49–0.85	
Male	1		
Education			<0.001
College graduate	0.26	0.15–0.43	
High school or some college	0.64	0.4–1	
Less than high school	1		
Work hours			0.045
<30 hr	0.62	0.4–0.95	
30–39 hr	0.72	0.48–1.1	
40+ hr	1		
Work weeks			<0.001
<15 wk	3.8	2.2–6.6	
15–30 wk	9.3	5.7–15.0	
31–45 wk	5.4	4.0–7.3	
46–52 wk	1		
Physical requirements			<0.001
Extremely strenuous	4.5	3.1–6.5	
Moderately strenuous	2.6	1.9–3.7	
Little/not strenuous	1		
Legal action			<0.001
Legal action	4.9	3.6–6.7	
None	1		

*P values compare workers' compensation (WC) and work-eligible patients using multiple logistic regression models that control for study cohort (IDH and SpS), data source (SPORT and NSN), initial treatment (surgical and nonoperative), and other independent covariates.

models (odds ratio = OR 2.0; 95% confidence interval, 0.75–5.6, $P = 0.16$).

■ Discussion

It is widely believed that patients receiving WC have inferior outcomes across a range of clinical conditions, includ-

Table 5. Factors Associated With Baseline Workers' Compensation Status for Patients in SPORT Only

Variable	Odds Ratio	95% CI	P*
Gender			0.001
Female	0.40	0.23–0.69	
Male	1.0		
Physical importance of lifting weight			0.001
Very/somewhat important	3.4	1.6–7.0	
Not important	1.0		
Patient preferred fewer work hours			0.003
No/not sure	3.0	1.5–6.1	
Yes	1.0		
Occupation			<0.001
Manager/professional	0.23	0.13–0.42	
Other	1.0		
Missed work past month			<0.001
≤1 day	0.15	0.09–0.26	
>1 day	1.0		
Legal action			<0.001
Legal action	3.9	1.9–8.0	
None	1.0		
Work at usual job without surgery			<0.001
No/small	2.3	1.2–4.4	
Moderate chance	0.58	0.28–1.2	
Big chance/certain	1.0		
Depleted financial resources			0.001
Yes	1.5	0.31–7.5	
No	0.57	0.12–2.7	
Refused	1		

*P values compare workers' compensation (WC) and work-eligible patients using multiple logistic regression models that control for study cohort (IDH and SpS), treatment cohort (RCT and OBS), initial treatment (surgical and nonoperative), and other independent covariates.

ing spine disorders, despite limited evidence from well-controlled clinical trials.¹¹ To what extent differences in patient characteristics and clinical features among those with and without WC explain inferior outcomes is unclear.^{10,29} Even if worse outcomes are true, the mechanism for this association between disability status and clinical outcome remains to be elucidated.²⁰ This study sought to examine differences in socioeconomic characteristics among patients with disability compensation due to objectively defined spine conditions enrolled at sites in multiple states. Many important factors were identified that differentiated those with WC from those without disability compensation, including gender, education level, physically demanding activities, legal action taken, work hours, financial resources, and treatment expectations. These results were independent of study cohort, spine condition, or initial treatment plan.

Most studies comparing baseline characteristics of patients with and without disability compensation have included patients with nonspecific low back pain of various duration from single institutions and have not included a wide range of socioeconomic features or used regression modeling to assess independence.^{15,23,30,31} Nevertheless, factors identified in the current study have been noted previously, including gender,^{15,30} work hours and its physical demands,^{23,31} education level,³¹ and economic factors.²⁰ Few studies report information on patient expectations and our finding that treatment expectations are associated with disability status warrants further study. Although age is commonly reported as a factor associated with disability compensation, it was not independently associated with WC after adjusting for other characteristics in this study. It is possible that this difference may relate to the current study, including more older workers with SpS. Although they only represented 13% of WC patients, they represented 26% of patients with other disability compensation and both rates will likely increase as the work force ages.

Advantages of this study are its large sample of patients enrolled at sites in multiple states with well-defined spine conditions without prior spine surgery. Since most prior work comes from single institutions/states and WC is a state-based program in the United States, it is hard to generalize results from these studies.³² Moreover, most WC involves patients with nonspecific low back pain, a heterogeneous condition with many potential causes that can be hard to identify with certainty. Examining patients with spine conditions that have specific symptoms and examination/imaging findings diminishes the likelihood that the clinical condition explains differences among those with and without disability compensation.

Several important limitations should also be recognized. Since SPORT and NSN were not specifically designed to examine disability populations, limited baseline questions were available about psychosocial and work characteristics potentially related to disability compensation status.³³ To create a large, multistate sample of patients WC, we included patients from very different clinical studies, NSN and SPORT. Although we carefully developed eligibility

criteria for NSN patients to mirror those in SPORT, it is possible that those found eligible may still be different in important but immeasurable ways. However, similarities in the socioeconomic variables identified in separate regression models reinforce the generalizability of these findings. Finally, we included patients both receiving and applying for disability compensation. Although only the former are included in most studies from the disability literature, clinicians evaluate patients when final disability status is often still pending and thus do not differentiate among those with receiving or pending status. In addition, excluding those with applications pending did not change study findings.

Since many sites contributed data to both NSN and SPORT, we were able to directly compare the percentage of patients with disability compensation enrolled in these 2 studies, a practice-based sample and a more restrictive clinical efficacy trial. Although the percent of patients with other disability compensation insurance was similar in SPORT and NSN, those with WC were much less likely to be enrolled in SPORT. The similar percentage of WC patients in SPORT randomized and observational cohorts suggests that lack of patient willingness to participate does not explain the lower WC enrollment in SPORT. It is also possible that WC patients enrolled in NSN were more likely to be seeking a second opinion rather than a primary treatment evaluation. Since results from efficacy trials such as SPORT are important in determining treatment recommendations for all patients with these radicular spine syndromes, including those with WC, these lower enrollment rates raise concerns about how SPORT findings will be generalize to the broader disability population. Comparing outcomes from WC patients enrolled in SPORT and NSN will help assess the generalizability of findings from SPORT.

By highlighting these marked socioeconomic differences among patients with and without disability compensation, one may wonder whether current perceptions about patients with WC reflect misplaced frustration about inferior outcomes rather than concern about the socioeconomic disparities observed. The medical literature is replete with references to “secondary gain” as an explicit or implicit explanation for inferior outcomes in patients with WC.^{10,34} The implication is that patients are at fault when it comes to these observed outcomes. The disparities in the literature offer an alternative hypothesis that may explain variation in outcomes for preference sensitive conditions such as back pain.³⁵ We hypothesize that differences in clinical outcomes among patients based on disability compensation are mediated at least in part by important socioeconomic disparities in these populations.³⁶ The DOLOR study identified that these socioeconomic factors are associated with worse outcomes among WC patients, such as applying for long-term disability through the Social Security Disability Insurance program.³³ This study confirms that such differences exist and their magnitude is large. Future work should examine the impact of controlling for such differences in studies assessing clinical and disability outcomes over time. It

may be time to stop blaming patients receiving disability compensation for their outcomes, and to start helping them address socioeconomic barriers that adversely influence the health care they receive and its outcomes.

■ Key Points

- Patients receiving workers' compensation may be underrepresented in clinical efficacy trials of conditions commonly seen in working individuals.
- Socioeconomic characteristics markedly differ among patients receiving workers' compensation compared with those not receiving disability compensation.
- Studies contrasting outcomes of care for patients receiving workers' compensation need to consider as possible confounders baseline characteristics and clinical features associated with receiving disability compensation.



document

Appendix available online through Article Plus.

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