Comparison of Cervical Disc Replacement Outcomes by Insurance: Workers' Compensation vs. Private

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INTRODUCTION: Little to no literature has evaluated the influence of workers' compensation (WC) insurance status on outcomes following cervical disc replacement (CDR). We aim to evaluate perioperative characteristics, patient-reported outcome measures (PROMs), and rates of minimal clinically important difference (MCID) achievement among WC vs. privately insured patients undergoing CDR.

METHODS:

A retrospective dataset of a single surgeon was used to identify WC and private insurance patients undergoing 1-level or 2-level CDR. Patients who had Medicare/Medicaid, unavailable insurance status, or had surgery performed for trauma, infection, or malignancy were excluded. Patients were divided into two groups, those presenting with or without WC insurance. Demographic characteristics, perioperative variables, and preoperative spinal pathologies were collected and compared between groups. PROMs evaluating pain, disability, and physical function were collected preoperatively and postoperatively at 6-weeks, 12-weeks, 6-months, and 1-year. At each timepoint, PROMs were compared within groups to preoperative baseline scores and between groups. MCID achievement was determined using established threshold values for change in PROMs from preoperative to each postoperative timepoint and compared between groups. RESULTS:

A total of 121 patients met the inclusion criteria with most being non-obese (64.5%) and male (62.8%). Ethnicity, smoking status, and hypertension were significantly varied by insurance status ($p\leq0.027$, all). No other demographic differences were present between cohorts. Majority of patients presented with herniated nucleus pulposus (98.4%), followed by myeloradiculopathy (85.7%), and central stenosis (51.2%), with no differences in the proportion of diagnoses among cohorts. The majority of procedures were single-level (71.9%), with 34 double-level CDRs (28.1%), and no difference in the proportion of 1- vs. 2-level surgeries between cohorts. No perioperative variables significantly differed between cohorts. While non-WC patients improved for all PROMs at all timepoints, except for SF-12 PCS at 1-years (p=0.072), WC patients did not improve for VAS arm at 6-weeks, NDI at 6-weeks and 1-year, SF-12 PCS from 6-weeks until 1-year, or PROMIS-PF at 6-weeks, 12-weeks, or 1-year ($p\geq0.050$, all). WC patients experienced significantly higher neck pain at 6-weeks and 6-months postoperatively, arm pain at 6-weeks postoperatively, and disability preoperatively and at all postoperative timepoints following CDR ($p\leq0.048$, all). WC patients reported lower levels of physical function for PROMIS-PF at 6-weeks and SF-12 PCS at 6-weeks, 12-weeks, 12-weeks, and 1-year following surgery. MCID achievement rates were significantly lower among WC patients for VAS neck at 6-months (p=0.045) and NDI throughout the overall postoperative period and all individual timepoints, except for NDI at 12-weeks ($p\leq0.020$, all). No other differences were observed between WC and private insurance patients for MCID attainment.

DISCUSSION AND CONCLUSION: CDR is a safe procedure for WC patients, as no differences were observed for mean operative time, blood loss, hospital stay, or acute postoperative pain/narcotic consumption when compared to privately insured counterparts. However, as significant pre- to postoperative improvements were less frequent and mean ratings for disability, physical function, and 6-week back/leg pain were poorer among WC claimants, this patient population may suffer from inferior postoperative recovery. Nevertheless, while clinically meaningful improvements for disability were less likely among WC patients, MCID achievement for pain and physical function was unaffected. Future research is

findings.

ecess			verify					a	and			strengthen					our		
Table 1. Patient Demographics Table 2. Perioperative Characteristics								Table 3. Mean Patient Reported Outcomes											
haracteristic	Total (n=121)	Compensation (n=32)	Insurance (n=89)	*p-value	Characteristic	Total	Workers' Compensation	Private Insurance	*p-value	PROM	Workers' Compensation	*p-value	Private Insurance	†p-value	*†p-value	Table 4. Minim	am Clinically Important Diff	ference	
ge (mean ± SD, years)	45.9 ± 10.2	45.2 ± 11.4	46.2 = 9.8	0.643	Calcul Back down	(1-14)	(0~54)	(0*89)			Mean + SD		Mean + SD			PROM	Workers' Compensation	Private insurance	-p-vaue
a				0.483	Musicanter	1.155 (7)	3.3% (D)	1.2%(1)	0.426	VAS DECK	63.033		(1.00		0.683	VAS nork	74,00		
Non-Obese	64.5% (78)	59.4% (19)	66.3% (59)		Badicalonathy	8 3% (10)	315(0)	10.1% (9)	0.218	recopensave	0.3 # 2.3		0.3 # 2.3		0.085	6-00085	35 356 (6)	56.8% (25)	0.132
Obese	35.4% (43)	40.6% (13)	33.7% (30)		Manloradicalonathy	85 7% (107)	87.5% (28)	85 155 (74)	0.736	b-weeks	4.2 = 2.4	0.046	2.5 = 2.4	-10,001	0.017	12-works	53 3% (8)	22.3% (34)	0.120
ender				0.418	LINP	99.4% (119)	95 8% (31)	98.916 (88)	0.445	12-weeks	2.9 ± 1.5	6.001	1.8 ± 2.3	<0.001	0.082	6 mmba	53 356 00	82 156 (23)	0.045
Female	37.2% (45)	31.3% (10)	39.3% (35)		Control Stanovis	\$1.255 (67)	\$2.15(17)	50.605 (45)	0.804	6-months	3.6±1.6	6.063	1.7 ± 2.1	<0.001	0.002	Lunar	71.855 (5)	55 655 (10)	0.467
Male	62,8% (76)	68.8% (22)	60.7% (54)		Entering Departs	24.065 (200)	25.000 (11)	23.66 (23)	0.221	1-year	2.7 ± 1.9	0.009	2.9 ± 3.5	0.001	0.863	Ormal	63.692.03.0	22.855 (45)	0.160
theicity				0.092	O TOTAL DE LA COMPANY	24/076 (27)	27/7/3(4)	4378 (41)	0.151	VAS arm						MAR	40,003 (14)	133874 (43)	0.207
Cascasian	80.7% (91)	61.3%(19)	87,5% (77)		Operative 1ime	a	60.1 - 00.0	****	0.042	Prosperative	5.7 ± 2.6	-	5.8 ± 2.6		0.941	* As and	18.887 (22)	41.087.7180	0.000
African American	7,6% (9)	16.1%(5)	4,6%(4)		(Mean = SU; min)	51.9 ± 16.6	54.1 = 24.4	51.9 ± 14.3	0.945	6-weeks	3.9 ± 2.9	0.104	1.8 ± 2.5	-10.001	0.010	10 weeks	10.076 (3)	41.576 (18)	0.099
Hisnanic	8.4% (10)	22.6% (7)	3.4%(3)		Estimated Blood Loss					12-weeks	24+25	0.011	2.3 ± 3.0	<0.001	0.916	12-weeks	28.076 (4)	48.976 (22)	0.181
Asian	2.5%(3)	0.0% (0)	3.4%(3)		(Mean ± SD; mL)	26.8±7.1	25.8 ± 4.5	27.2 ± 8.0	0.370	6-months	3.3 ± 2.0	0.020	3.0 ± 3.1	<0.001	0.590	6-montais	10.756(2)	50.0% (11)	0.006
Other	0.8%(1)	0.0% (0)	1.1%(1)		Number of Levels				0.644	1-year	2.5 ± 2.4	0.010	2.0 ± 2.3	0.001	0.649	1-year	42.9% (3)	55.6% (10)	0.568
Naborie States	ww.2401	wa/401	1.1.54(1)	0.784	Single-level	71.9% (87)	68.8% (22)	73.0% (65)		ND						Overall	30.0% (6)	50.0% (29)	0.121
Nas Diskatia	07.65 (119)	86.001.2333	07.991 (27)	20.004	Double-level	28.1% (34)	31.3% (10)	27.0% (24)		Beneration	47.6 + 10.2		28.0 + 17.0		0.048	NDI			
Distances	2.69/ (20)	1.26 (1)	2.69 (2)		Length of Stay					1 rooperative	41.0 + 10.2	0.000	21.4 + 14.9	-0.001	0.000	6-weeks	31.3% (5)	67.4% (29)	0.012
LABALIA.	2.7.9(7)	Ae3(0)	2/0/9 (4)		(Mean ± SD; hours)	8.0 ± 5.9	8.0 ± 5.3	8.0 ± 6.1	0.996	10 weeks	91.0 = 19.5	0.007	21/0 = 10/0	-0.001	0.001	12-weeks	64.3% (9)	79.2% (38)	0.253
moving Statis	00.001 (110)	EL 204 (200	AL 82 (2.0)	4.037	Day of Discharge				0.784	12-weeks	20.1 2 17.4	0.011	15.7 ± 13.0	-0.001	10.007	6-months	40.0% (6)	89.7% (26)	<0.001
INDE STORE	90.9%(110)	61.379 (20)	54,455 (84)	40427	DOD 0	92.155 (20)	93 8% (15)	91 2% (55)		0-meetis	30.0 ± 14.0	0.001	12.1 # 13.7	-0.001	-0.001	1-year	42.9% (3)	88.2% (15)	0.020
STROAD	2.1%(11)	18.876(0)	3,0%(3)		POD 1	7.9% (6)	63%(1)	8 3% (5)		1-year	29.7 2 21.0	0.084	13.0 ± 13.5	40.001	0.026	Overall	57,1% (12)	85.3% (52)	0.007
opennissii Statis	AL 1941 (1497)	ALC: NO. 10.10		0.022	Bastomention Vectoria	1014(0)	0.074(1)	40/400		SF-12 PCS						SF-12 PCS			
Not-nypenetsive	89.874 (105)	15.0% (24)	913956(81)		DOD 0	41418	10-22	42+14	0.641	Preoperative	31.3 ± 6.5		35.6 ± 9.1		0.031	6-weeks	27.3%(3)	42.155 (16)	0.374
Hypernansive	175222 (16)	25,0% (8)	9,0% (8)		1000	36.00	25.00	4.5 = 1.0	0.041	6-weeks	33.8 ± 8.4	0.268	41.5 ± 10.0	<0.001	0.013	12-weeks	20.0% (2)	50.056 (20)	0.087
SA Classification				0.618	1001	3.5 # 0.0	3.2 = 9.0			12-weeks	36.1 ± 8.7	0.146	43.6 ± 10.2	<0.001	0.018	6-meths	57 156 (4)	50.0% (8)	0.752
4	31,3% (36)	27.6% (8)	32.6% (28)		Postoperative Nancour					6-months	37.3 ± 11.3	0.118	46.5 ± 11.8	0.002	0.076	Looper	143%(1)	50.0% (7)	0.112
22	68 7% (7%)	72.4%(21)	67,4% (58)		Consumption (OME)					1-year	33.1 ± 9.2	0.266	41.7 ± 10.0	0.072	0.040	Overall	53 355 (8)	52 855 (28)	0.973
	6607940797	Sector (etg.	entra gray		POD 0	20.5 ± 17.4	16.6 ± 15.3	21.8 ± 17.9	0.153	PROMIS-PF						PP/MIS.PF			
CI Classification				0.359	POD 1	2.1 ± 10.2	0.7 ± 3.5	2.7 ± 11.6	0.331	Prooperative	38.7 ± 6.8		41.2 ±7.0		0.182	6 combs	40.055 (40	52.155 (17)	0.469
<1	65.9% (29)	54.6% (6)	69.7% (23)							6-weeks	39.9 ± 9.3	0.318	47.3 ± 8.4	0.006	0.015	12 mesha	50.05C (D)	24.287 (200)	0.142
21	14100.000	4.000	10.202 (1.0)		HNP - hernisted nucleus	pulposas; POD = pos	teperative day; ml mill	Elters; SD= standard de	vielan	12-weeks	43.3 ± 8.6	0.135	49.3 ± 10.5	<0.001	0.073	12-neuks	77 884 (7)	77 78 (14)	0.755
E.I.	34.155(13)	43.376(3)	30.355(10)		 p-values calculated usin 	g Student's t-test for a	ontinuous variables and o	thi-square analysis for c	ategorical variables	6-months	47.5 ± 12.7	0.035	53.0 ± 12.5	<0.001	0.186	ouxuns	77.876 (7)	72.776 (10)	0.111
BRANCE	A 444 A	A 444 A	A 444 A		Boldface indicates signif	cance				1-year	45.2 ± 9.1	0.172	52.8 ± 11.7	0.001	0.143		73.0%(3)	64.7%(11)	0.894
Windows?	(varia (0)	ww/6 (0)	(0) a (0)							*p-values calculate	d using paired sample	t-test to determin	to properative to pay	country increase	ment in Workers'	Overall	71.455(10)	(7.9% (41)	0.643
woncers										Conversion orbot						*p-values calculated using chi-square analysis			
onpensation	20.359 (32)	100.0% (32)	0.976 (0)	5(0)							Transformers to be a second seco						ograticance		
Private 75.855 (89) 0.055 (0) 100.074 (89)								Compression colu	Conversation other										
SA = American Society of An	esthesiologists; CCI	- Charlson Comerbidity	(Index; SD= standard de	viation						*te-values calculat	ed using Stadent's t-t	of to commune me	an PROMs between	oth caborts					
AND A DESCRIPTION OF A										Reldfare indicates	inificance								