WASHINGTON UNIVERSITY SCHOOL OF MEDICINE
AT BARNES-JEWISH HOSPITAL
Department of Orthopaedic Surgery

PROMIS Physical Function Correlation with NDI and mJOA in the Surgical Cervical Myelopathy Patient Population

- Washington University in St Louis Department of Orthopedic Surgery
- Robert Owen MD, Lukas Zebala MD, Steven McAnany MD

Background

- Legacy outcome measures are essential for analyzing treatments for cervical myelopathy
  - Examples: mJOA (Modified Japanese Orthopedic Association) NDI (Neck Disability Index)
- **Administrative burdens** impose limits on completion of legacy measures
- Concerns exist over the reliability and precision with which legacy assessments capture primary outcomes of interest, and the ability to compare outcomes across disparate populations

Background

- The **PROMIS** group developed a patient outcome measure system to improve reporting of patient symptoms, function, and health and to reduce administrative burden
  - Early success seen with use in orthopedics
  - NDI and mJOA scores have not been compared with PROMIS in patients with cervical myelopathy undergoing surgery
- **Purpose**: Compare NDI and mJOA with PROMIS physical function scores to determine their correlations in a cervical myelopathy surgical patient population longitudinally

Methods

- 60 patients with diagnosis of cervical myelopathy that met inclusion criteria were included
  - All patients treated by 4 spine surgeons at tertiary spine center
- PROMIS, NDI, and mJOA were collected preoperatively and in early follow up (within 6 months)
- Correlations between mJOA and NDI with PROMIS physical function were quantified using Pearson correlation coefficient measurements and analyzed for significance with t-test

Results

- **Demographic Data**

	Average	Range	Surgical Procedure	N (%)
Age (years)	60	24-81	**ACDF**	22 (37%)
Male (n, %)	34 (57%)		**ACDF + PSF**	8 (13%)
Female (n, %)	26 (43%)		**Laminoplasty**	15 (25%)
# Levels	4.02	2-9	**Decompression + PSF**	13 (22%)
			Laminectomy +/- Laminoforaminotomy	2 (3%)

Legend: ACDF = anterior cervical discectomy and fusion, PSF = posterior spinal fusion

Results

- 60 (100%) of patients completed questionnaires at preop
- 55 (92%) of patients completed questionnaires at early follow up
- Patients showed significant improvements in NDI, mJOA, and PROMIS physical function ($p<0.01$)
- **mJOA and PROMIS physical function correlation**
  - Strong positive correlation
  - R = (0.61, 0.72) (preop, early follow up)
- **NDI and PROMIS physical function correlation**
  - Strong negative correlation
  - R = (-0.69, -0.76) (preop, early follow up)

Results

- **Outcomes Data**

Event	n	PROMIS PF	NDI	mJOA
Baseline	60 (100%)	36.11	40.42	12.28
Follow up	55 (92%)	38.41	28.91	13.62
P value		0.006	<0.0001	0.002

Legend: PROMIS PF = Patient Reported Outcomes Measurement Information System Physical Function, NDI = Neck Disability Index, mJOA = Modified Japanese Orthopedic Association score

Results

- **Correlation Data**

	NDI + PROMIS PF		mJOA + PROMIS PF		NDI + mJOA	
	Baseline	**Follow up**	**Baseline**	**Follow up**	**Baseline**	**Follow up**
R	-0.69	-0.76	0.61	0.72	-0.53	-0.60
R squared	0.48	0.58	0.37	0.51	0.28	0.36
95% interval	(-0.82/-0.50)	(-0.86/-0.61)	(0.36/0.78)	(0.53/0.84)	(-0.72/-0.26)	(-0.76/-0.38)
P value	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001

Legend: PROMIS PF = Patient Reported Outcomes Measurement Information System Physical Function, NDI = Neck Disability Index, mJOA = Modified Japanese Orthopedic Association score

Conclusions

- PROMIS physical function scores have a strong negative correlation with NDI scores at baseline and in the postoperative course in patients undergoing surgery for cervical myelopathy
- PROMIS physical function scores have a strong positive correlation with mJOA scores at baseline and in the postoperative course in patients undergoing surgery for cervical myelopathy

Conclusions

- Surgeons may factor these outcomes into the delivery and interpretation of patient reported outcome measures in patients with cervical myelopathy undergoing surgery
- Use of PROMIS physical function for this patient population may improve completion of outcome measures in the office and reduce administrative burden while still providing reliable outcomes data

Disclosures

- No grant/research support, consultations, stock/shareholder, royalites, or other financial relationships to report