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Dysphagia should be Reported as a Separate Legacy Outcome Measure after Anterior Cervical Discectomy and Fusion

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INTRODUCTION: Dysphagia is a common complication after anterior cervical discectomy and fusion (ACDF) but is not a routinely asked question in legacy patient-reported outcome measures. This study looks to see whether there are associations between dysphagia and legacy outcome measures.

METHODS: We retrospectively reviewed 168 patients who underwent ACDF surgery from 2017 to 2019 at a single institution. Demographics, anthropometric data, Neck disability index (NDI), visual analog scale (VAS) pain scores, PROMIS-Health and -Mental scores, Charlson Comorbidities Index (CCI), and Eating Assessment Tool (EAT-10) were obtained for each patient preop and 1, 3, 6, and 12 months postop. Repeated measure correlations and mixed regression analyses on repeated measures were performed.

RESULTS: Significant but weak correlations existed between NDI and EAT-10 at 1, 3, and 6 months postoperatively ($p < 0.001$, $r < 0.4$). Both PROMIS-Physical and -Mental scores showed weak but significant correlations with EAT-10 at 3 ($p < 0.003$, $r = -0.26$; $p < 0.02$, $r = -0.21$; respectively) and 6 months ($p < 0.01$, $r < -.24$) postoperatively. There were significant but weak correlations between VAS-pain and EAT-10 scores at 1, 3, and 6 months postoperatively ($P < 0.003$, $R < 0.3$). In all comparisons of EAT-10 with legacy outcome measures, the correlations became weaker with increased postop time. There was a positive association between EAT-10 and both CCI and BMI ($p < 0.05$).

DISCUSSION AND CONCLUSION:

Significant but weak correlations exist between dysphagia scores and legacy patient-reported outcome measures in patients undergoing ACDF. The association decreases with time; therefore, dysphagia scores should be reported separately when looking at outcomes after ACDF. Patients with higher BMI and more comorbidities are also at increased risk for dysphagia.

Main Independent variable: NDI score
Dependent variable: EAT-10 Score

Time	NDI score & EAT-10	
	Correlation Coefficient	P-value
Pre-operative	0	0.56
	1	0.35
	3	0.41
Post-operative	6	0.36
	12	0.17
Across over time (Repeated measures)	0.20	< 0.001

Main Independent variables: PROMIS-physical, PROMIS-mental
Dependent variable: EAT-10 Score

Time	PROMIS-physical & EAT-10	
	Correlation Coefficient	P-value
Pre-operative	0	-0.05
	1	-0.12
	3	-0.26
Post-operative	6	-0.22
	12	-0.09
Across over time (Repeated measures)	-0.05	0.25

Time	PROMIS-mental & EAT-10	
	Correlation Coefficient	P-value
Pre-operative	0	-0.10
	1	-0.09
	3	-0.21
Post-operative	6	-0.24
	12	-0.07
Across over time (Repeated measures)	-0.05	0.25

Main Independent variable: VAS-Neck Pain
Dependent variable: EAT-10 Score

Time	VAS-Neck Pain & EAT-10	
	Correlation Coefficient	P-value
Pre-operative	0	0.09
	1	0.27
	3	0.30
Post-operative	6	0.27
	12	0.10
Across over time (Repeated measures)	0.05	0.25

Patient Characteristics: (n=168)

Characteristics	n
Age	57.4 ± 12.1
Gender	
Female	88 (52.4%)
Male	80 (47.6%)
BMI	30.0 ± 5.6
Charlson Index Score	1.1 ± 2.3
Opisoid	
Yes	46 (27.4%)
No	122 (72.6%)
Depression	
Yes	46 (27.4%)
No	122 (72.6%)
Anxiety	
Yes	44 (26.2%)
No	124 (73.8%)
Smoke	
Yes	23 (13.7%)
No	145 (86.3%)
Alcohol	
Yes	9 (5.4%)
No	159 (94.6%)