

# Pre-operative Quality of Life Scores and High-value Care Outcomes in Patients with Malignant Brain Tumors

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## BACKGROUND

- Malignant brain lesions are rapidly fatal and devastating cancers
- Widespread use of assessment scores to estimate patients' overall health and predict adverse outcomes
  - Karnofsky Performance Status (KPS)
  - American Society of Anesthesiologists (ASA) score
  - Modified 5-item frailty index (mFI-5)
- Rising interest in the application of patient reported health-related quality-of-life (HRQOL) measurements in neurosurgery

## STUDY OBJECTIVE

- This study investigated the association between patient-reported HRQOL measurements and high-value care outcomes using the PROMIS-29 v2.0 survey

## METHODS

- Study Design
  - Retrospective cohort analysis
- Setting
  - Johns Hopkins Hospital/ Bayview Medical Center
  - Jan 2018 - Jan 2022
- Population
  - Adult patients with malignant brain tumors (glioblastomas and metastatic brain lesions)
- Data Collection
  - Review of patient EMR
- Main Outcomes
  - Postoperative outcome measures
- Statistical Analysis
  - Univariate and multivariate logistic regression models
  - Spearman Correlation with other established assessment scores

Sample PROMIS-29 survey

Physical Function	Without any difficulty	With a little difficulty	With some difficulty	With much difficulty	Unable to do
Are you able to do chores such as vacuuming or yard work?.....	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Are you able to go up and down stairs at a normal pace?.....	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Are you able to go for a walk of at least 15 minutes?.....	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Are you able to run errands and shop?.....	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

## RESULTS

Table 1. Patient demographics

Demographics	n (%)
Number of patients	60
Age, Mean (SD)	62.32(10.28)
Female	29(48.3)
Race	
Caucasian	45(75.0)
African-American	7(11.7)
Asian	5(8.3)
Other	3(5.0)
Hispanic/Latino	1(1.7)
Marital status	
Married	46(76.7)
Single	8(13.3)
Divorced	3(5.0)
Widowed	2(3.3)
Insurance	
Private	31(51.7)
Medicare	26(43.3)
Medicaid	3(5.0)

Table 2. Clinical characteristics

Clinical Measures	Glioblastoma (n=29)	Metastatic (n=31)	p-value
KPS (mean, SD)	85.86 (7.80)	89.03 (3.00)	0.070
ASA (mean, SD)	2.86 (0.44)	3.00 (0.25)	0.132
mFI-5 (mean, SD)	1.72 (0.75)	1.90 (1.01)	0.770
LOS in days (mean, SD)	8.00 (5.70)	7.16 (3.33)	0.899
Discharge (mean, SD)			0.079
Home	17 (60.7)	25 (83.3)	
Non-home	11 (39.3)	5 (16.7)	
Readmission			
30-day (n,%)	4 (13.8)	10 (32.3)	0.129
90-day (n,%)	7 (24.1)	7 (22.6)	0.887
180-day (n,%)	13 (44.8)	8 (25.8)	0.176
Mortality			
30-day (n, %)	1 (3.4)	1 (3.2)	0.962
90-day (n, %)	2 (6.9)	2 (6.5)	0.945
180-day (n,%)	2 (6.9)	3 (9.7)	0.697

Table 3. PROMIS-29 subcategory scores vs. the U.S. general population

PROMIS 29 subcategories	T scores, Mean (SD)	95% CI	p-value
Pain Interference	52.05 (11.00)	-0.79 - 0.89	0.154
Depression	49.72 (9.07)	-2.62 - 2.06	0.814
Physical Function	43.57 (9.64)	-8.95 - -4.09	<b>&lt;0.001</b>
Ability to Participate in Social Roles	47.96 (10.87)	-4.84 - 0.77	0.152
Fatigue	51.59 (11.20)	-1.29 - 4.49	0.274
Anxiety	54.99 (10.16)	2.37 - 7.62	<b>&lt;0.001</b>
Sleep Disturbance	50.96 (10.15)	-1.65 - 3.58	0.464

Table 4. Association between PROMIS-29 subcategory scores and non-home discharge disposition

PROMIS 29 subcategories	Odds Ratio	95% CI	p-value
Physical Function (1 pt increase)	0.888	0.816 – 0.966	<b>0.006</b>
Ability to Participate in Social Roles (1 pt increase)	0.921	0.862 – 0.985	<b>0.016</b>

The model is adjusted with age, sex, race, ethnicity

## Secondary Analyses

When the association between frailty indices and PROMIS 29 subcategories was investigated, mFI-5 was found to be significantly associated with sleep disturbance

## CONCLUSIONS

- Compared to the general population, patients with malignant brain lesions have significantly worse **physical function** and **anxiety**
- Physical function and ability to participate in social role scores were **independently** and **significantly** associated with increased odds of **non-home discharge disposition**
- Patients with greater **frailty** had more severe **sleep disturbances**
- Patient-reported HRQOL measurements can **inform the decision making** of patients and treatment team alike

## LIMITATIONS

- Limited number of patients
- Limited perioperative variables considered in analysis

## IMPLICATIONS

- Future analysis to compare the specificity and sensitivity of PROMIS-29 against established indices in predicting high-value care outcomes
- Further studies are needed to investigate changes in pre-operative and post-operative PROMIS-29 scores

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