

Use of 3-month STarT Back Screening Tool in Predicting PROMIS-29 Domains

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Introduction

Early STarT Back Tool (SBT), a 9-item measure assessing disability risks through questions on pain, pain-interference, and psychosocial risk factors, has little evidence in predictive ability of post-operative outcomes.

Univariable analyses showed similar improvement in 1-year postoperative pain across preoperative SBT groups (Storm, 2018). Multivariable analyses of data from 339 participants undergoing lumbar spine surgery showed no association between preoperative SBT risk group status and 1-year disability, pain, or physical function (Coronado, SpineWeek 2023)

Purpose: to examine to what degree 3-month SBT is associated with physical function (PF), depression (DEP), anxiety (ANX), fatigue (FAT), and pain interference (PI) and intensity (PAIN), at 12-month post-lumbar spine surgery.

Thinking about the last 2 weeks tick your response to the following questions:

	Disagree 0	Agree 1
1 My back pain has spread down my leg(s) at some time in the last 2 weeks	<input type="checkbox"/>	<input type="checkbox"/>
2 I have had pain in the shoulder or neck at some time in the last 2 weeks	<input type="checkbox"/>	<input type="checkbox"/>
3 I have only walked short distances because of my back pain	<input type="checkbox"/>	<input type="checkbox"/>
4 In the last 2 weeks, I have dressed more slowly than usual because of back pain	<input type="checkbox"/>	<input type="checkbox"/>
5 It's not really safe for a person with a condition like mine to be physically active	<input type="checkbox"/>	<input type="checkbox"/>
6 Worrying thoughts have been going through my mind a lot of the time	<input type="checkbox"/>	<input type="checkbox"/>
7 I feel that my back pain is terrible and it's never going to get any better	<input type="checkbox"/>	<input type="checkbox"/>
8 In general I have not enjoyed all the things I used to enjoy	<input type="checkbox"/>	<input type="checkbox"/>

9. Overall, how bothersome has your back pain been in the last 2 weeks?

Not at all	Slightly	Moderately	Very much	Extremely
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0	0	0	1	1

Total score (all 9): _____ Sub Score (Q5-9): _____

The SBT is a 9-item measure used to determine risk of low back pain-related disability

Risk stratification

Low risk: score of 3 or less

Medium risk: score of 4 or more and a sub-score from Q5-9 of 3 or less

High risk: score of 4 or more and a sub-score from Q5-9 of 4 or more

Primary care, emergency department, and outpatient settings

Methods

Inclusion: Vanderbilt Spine Registry patients who received non-deformity lumbar spine surgery for degenerative disk disease, had 3-month SBT and 12-month patient reported outcomes (PRO), and ≥ 18 years old were included in this study.

Outcomes: The PROs included 12-month PROMIS-29 PF, DEP, ANX, FAT, and PI domains as well as PAIN.

Independent Variable: Patient's risk levels of low, medium, and high were classified using the 3-month SBT.

Analysis: Multivariable logistic regressions were used to assess the impact of adding 3-month SBT risk levels (block 2) to block one which included patient, clinical, and surgical characteristics. Change in R-square and F-statistics, regression coefficients, and standardized beta, for effect size, are presented.

Results

Two hundred and fifty-one patients met inclusion criteria.

182 (73%) patients low, 47 (19%) medium, and 22 (9%) high risk.

Compared to low risk patients and controlling for confounders, high risk had significantly lower PF ($B = -3.2$, 95%CI= $-6.2, -0.2$) and higher DEP ($B = 5.1$, 95%CI= $1.8, 8.4$), FAT ($B = 3.8$, 95%CI= $0.1, 7.4$), PI ($B = 6.2$, 95%CI= $2.3, 10.2$), and PAIN ($B = 1.0$, 95%CI= $0.1, 1.9$).

Medium risk group also had significantly lower PF ($B = -2.4$, 95%CI= $-4.4, -0.4$) and higher PI ($B = 3.2$, 95%CI= $0.5, 5.9$).

Effect sizes were small according to standardized betas (β), ranging from 0.10 to 0.18.

Table 1. Demographic and surgical characteristics of sample

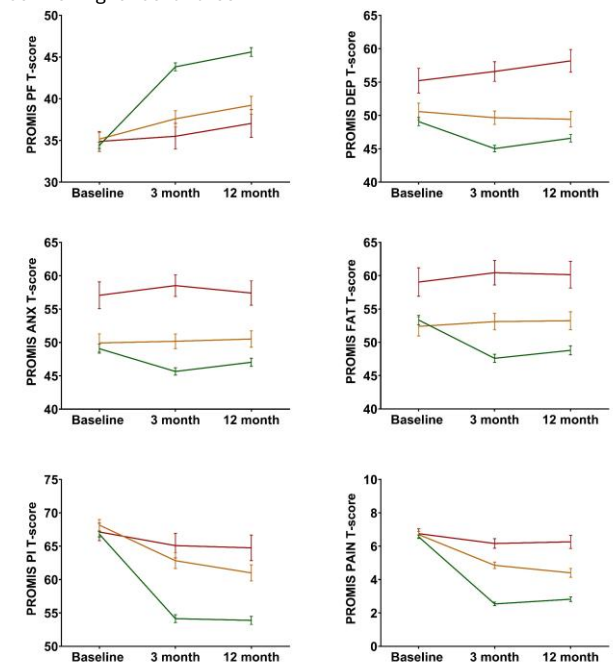
Characteristic	N = 251
Mean \pm SD age, in years	62.7 \pm 14.5
N (%) Female	115 (46%)
N (%) White	226 (90%)
N (%) Has private insurance	102 (41%)
N (%) Current smoker	23 (9%)
N (%) Independent ambulator	192 (77%)
N (%) Fusion	120 (48%)
N (%) Revision	92 (22%)
N (%) Taking preoperative opioids	42 (17%)

Table 2. R² values for models with covariates and adding SBT

Model	R ² : Covariates	Change in R ² : Add SBT
Physical Function	0.629	0.011*
Depression	0.491	0.019*
Anxiety	0.517	0.004
Fatigue	0.495	0.011+
Pain Interference	0.486	0.025**
Pain Intensity	0.632	0.008+

+p<0.10; *p<0.05; **p<0.01

Figure 1. Estimated marginal means of PROMIS scores over time controlling for covariates



Conclusions

Risk levels of the SBT collected early post-lumbar spine surgery may offer some insight into a patient's postoperative rehabilitation needs beyond 3-months.

Risk stratification based on the SBT may have utility for postoperative rehabilitation decision making

Further evidence is needed to better understand the needs of medium and high-risk patients.