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Comparison of Back Pain Prognostic Risk Stratification Item Sets

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Abstract: Back pain outcomes may be improved and costs lowered through risk-stratified care, but relative performance of alternative item sets for predicting back pain outcomes has not been well characterized. We compared alternative prognostic item sets based on STarT Back and Chronic Pain Risk screeners in a cohort of patients initiating primary care for back pain. The STarT Back item set was brief and relied on binary responses, whereas the Chronic Pain Risk item set employed scaled responses and assessed pain persistence and diffuse pain. Patients (N = 571) were assessed soon after their initial visit and 502 (88%) were reassessed 4 months later. Items sets based on STarT Back and Chronic Pain Risk prognostic screeners, as well as a combination of items from both, were used to predict Chronic Pain Grade II-IV back pain at 4 months. The area under the receiver operating characteristic curve estimates (95% confidence intervals) were .79 (.74–.83) for items based on the STarT Back, .80 (.75–.83) for items based on Chronic Pain Risk, and .81 (.77–.85) for a composite item set. Differences in prediction were modest. Items from 2 prognostic screeners, and both combined, achieved acceptable and similar prediction of unfavorable back pain outcomes.

***Perspective:** Given comparable predictive validity, choice among prognostic item sets should be based on clinical relevance, number of items, ease of administration, and item simplicity.*

***Key words:** Complex regional pain syndrome, reflex sympathetic dystrophy, chronic pain, dysynchiria.*

Despite dramatic increases in use of tests, medications, injections, and surgery for back pain,[1,25,42] as well as in costs of back pain care,[27,28] improved pain and functional outcomes have not been realized, suggesting that new approaches to back pain care are needed.[7] A recent large randomized trial compared risk-stratified back pain care (intervention) to nonstratified current best practice care (control).[19] In the intervention arm, care was stratified by risk according to STarT Back screening tool scores.[2,3,11,13,15-18,30,43] Intervention patients with scores suggesting low risk of an unfavorable outcome were reassured and encouraged to resume normal activities, whereas medium- and high-risk patients received standardized physiotherapy to improve symptoms and function. For high-risk patients, physiotherapy also addressed psychosocial obstacles to recovery. Control patients received care-as-usual physiotherapy. Intervention patients were found to have improved functional outcomes and lower costs of care relative to controls.[19] This trial has increased interest in risk-stratified care, calling attention to the need for prognostic screeners able to accurately predict back pain outcomes.

The kinds of items used in different prognostic screeners have not been extensively evaluated or compared.[5] One prognostic screener, the Chronic Pain Risk Score, has been shown to predict outcomes of diverse pain conditions, including back pain, with acceptable accuracy.[8,9,35,39,40] The Chronic Pain Risk and the STarT Back prognostic item sets each have potential advantages, but they have not been directly compared.

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The STarT Back is brief and uses simple (binary) responses. The Chronic Pain Risk item set has been validated for predicting outcomes of diverse pain conditions, uses scaled responses, assesses pain persistence, and more completely assesses diffuse pain.

The aim of the present study was to evaluate and compare item sets similar to those used in these 2 validated prognostic methods (STarT Back and Chronic Pain Risk), in terms of prediction of unfavorable back pain outcomes among patients initiating a new episode of back pain care. We sought to determine whether STarT Back's use of binary responses, relatively few items, and limited coverage of diffuse pain and pain persistence resulted in a meaningful decrement in prediction of back pain outcomes relative to the Chronic Pain Risk items. We were also interested in whether combining STarT Back and Chronic Pain Risk items would improve prediction over either alone.

Methods

Patient Selection

Data for this research came from a prospective study of patients initiating a new episode of primary care for back pain.[36] Study participants were members of Group Health, a large health care plan in Washington State. Study procedures were approved by the Group Health Institutional Review Board. Patients aged 18 to 64 years who resided in the greater Seattle area, made a primary care back pain visit, and had no back pain visits in the prior year were eligible. Back pain was identified from *International Classification of Disease, Ninth Edition, Clinical Modification* visit codes.[4] Patients with the following were excluded: 1) prior lumbar spine surgery (defined by procedure codes[14] or self-report), 2) pregnancy, 3) Parkinson disease or multiple sclerosis diagnosis within the prior 3 years, 4) cancer diagnosis (other than nonmelanoma skin cancer) within the prior year, and 5) not continuously enrolled in Group Health for the previous 2 years. Previous analyses of data from this study evaluated prediction of back pain outcomes using Chronic Pain Risk items with augmented assessment of diffuse pain and psychological distress.[36]

Potential participants were mailed a letter describing the study, with a $2 bill enclosed. Interviewers then telephoned them to explain the study, verify eligibility, and obtain consent. To ensure that baseline assessments were within the appropriate time frame after the index visit, patients who could not be assessed within 14 days after the index visit were not enrolled. Participants completed a half-hour baseline telephone interview and were asked to complete a follow-up telephone interview 4 months later. Participants received $10 for each interview they completed.

Baseline Measures

The baseline interview included items similar to those in the STarT Back screener. The interview also included items used by the Chronic Pain Risk prognostic method. As shown in Table 1, the domains covered by both sets of items included pain diffuseness, back pain severity, and psychological characteristics (catastrophizing, fear avoidance, and/or depression). However, the specific items included in the 2 item sets differed. The STarT Back items were fewer in number and all but one used binary (eg, agree/disagree) responses. The Chronic Pain Risk items used scaled responses, included more complete assessment of diffuse pain, and assessed pain persistence.

STarT Back Item Set

The original STarT Back screening tool contains 9 items drawn from other measures. Our study used 6 items worded similarly to the corresponding STarT Back item, although scaled responses needed to be dichotomized for 4 of these items to replicate the binary responses of the STarT Back. Two items in our study (back pain spreading down the leg, and presence of neck or shoulder pain) were worded differently than the

Table 1. Items and Variables* in the 3 Prognostic Screeners

Variable	STarT Back Item Set: Variable (Number of Items)	Chronic Pain Risk Item Set: Variable (Number of Items)	Composite Item Set: Variable (Number of Items)
Pain diffuseness	Neck pain (1) Back pain spreads into leg (1)	Pain sites (7)	Pain sites (7) Back pain spreads into leg (1)
Back pain severity	Back pain bothersomeness (1)	Current, usual, and worst back pain intensity (0–10 ratings) (3)	0–10 rating of usual back pain intensity (1)
		Pain-related interference with activities (0–10 ratings) (3)	0–10 rating of pain-related interference with usual activities (1)
	Back pain–related activity limitations (2)		Back pain–related activity limitations (2)
Back pain persistence	—	Back pain days in the prior 6 months (1)	Back pain days in the prior 6 months (1)
Psychological characteristics	Depression (1) Catastrophizing (2) Fear avoidance (1)	Depression (8)	Depression (2) Catastrophizing (2) Fear avoidance (1)
Number of items	9 items	22 items	18 items
Number of predictor variables	7 predictors	4 predictors	8 predictors

*Table rows show predictor variables entered in the logistic regression model for that screener. Each predictor variable was the item score (for single items) or the sum or average of the item scores (for multiple items).