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The Value of Prognostic Screening for Patients With Low Back Pain in Secondary Care

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Abstract: Prognostic screening in patients with low back pain (LBP) offers a practical approach to guiding clinical decisions. Whether screening is helpful in secondary care is unclear. This prospective cohort study in adults with LBP placed on outpatient clinic waiting lists, compared the performance of the short-form Orebro Musculoskeletal Pain Screening Questionnaire, the Predicting the Inception of Chronic Pain Tool, and the STarT Back Tool. We assessed predictive validity for outcome at 4-month follow-up, by calculating estimates of discrimination, calibration, and overall performance. We applied a decision curve analysis approach to describe the clinical value of screening in this setting via comparison with a 'treat-all' strategy. Complete data were available for 89% of enrolled participants (n = 195). Eighty-four percent reported 'poor outcome' at follow-up. The area under the receiver operating characteristic curve (95% confidence interval) was .66 (.54–.78) for the Orebro Musculoskeletal Pain Screening Questionnaire, .61 (.49–.73) for the Predicting the Inception of Chronic Pain Tool, and .69 (.51–.80) for the STarT Back Tool. All instruments were miscalibrated and underestimated risk. The decision curve analysis indicated that, in this setting, prognostic screening does not add value over and above a treat-all approach. The potential for LBP patients to be misclassified using screening and the high incidence of nonrecovery indicate that care decisions should be made with the assumption that all patients are 'at risk.'

***Perspective:** This article presents a head-to-head comparison of 3 LBP screening instruments in a secondary care setting. Early patient screening is likely to hold little clinical value in this setting and care pathways that consider all patients at risk of a poor outcome are suggested to be most appropriate.*

***Key words:** Low back pain, prognostic screening, predictive validity.*

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Low back pain (LBP) is common, with a lifetime prevalence of 84%[2] and a global burden exceeding that of any other medical condition.[47] Back problems are frequently managed in primary care general practice. For example, 3.9 million LBP encounters were recorded in Australian general practice in 2009 to 2010.[3] Most patients who present with a new episode of LBP recover within 3 months,[34] however, many also experience recurrent or persistent symptoms.[18] Severe, persistent LBP may prompt referral for specialist consultation. Recent data show that Australian general practitioners refer their patients at a rate of 5.2 per 100 encounters.[3] The disproportionate representation of LBP among groups with lowest socioeconomic status[1] means that many government-funded secondary care clinics face high service demands.

There is increasing interest in the potential for 'stratified care' approaches to enhance the efficiency and benefits of health services.[11,16,43] This strategy relies on early prognostic screening to guide clinical decisions. Prognostic screening questionnaires can identify patients at high risk of a poor outcome[14,24,37,48] and offer the potential for timely treatment to be provided to those who need it most. This approach reduces costs and improves patient outcomes when integrated into primary care settings.[11,15]

Prognostic screening instruments for LBP have mostly been designed for primary care. It is well recognized, however, that instrument performance is highly setting-specific.[29] Variations in cohort characteristics across care settings[10,30] requires that instruments are validated in samples that differ from the development sample.[8] The predictive performance of the Keele STarT Back Tool (SBT) has been shown to be lower in secondary care than it is in primary care,[31] but investigations in secondary care cohorts are, on the whole, lacking.

Three self-report screening instruments that have shown clinical utility in primary care are: the 5-item instrument for 'Predicting the Inception of Chronic Pain' Tool (PICKUP)[42]; the 9-item SBT[14]; and the short-form Orebro Musculoskeletal Pain Screening Questionnaire (OMPSQ-s).[26] To date, there have been no studies comparing the predictive validity of these instruments in secondary care.

The clinical value of implementing prognostic screening in secondary care has also not previously been considered. In any setting with limited resources it is optimal for care to be allocated according to need. Whereas clinical decisions may be usefully guided by prognostic screening, there is potential for these instruments to misclassify patients. This will lead to unintentional overtreatment of patients with good outcomes and undertreatment of patients with poor outcomes. Recent advances in analytic approaches used to evaluate the performance of prognostic models[45] are able to offer an interpretation of clinical value—essentially, whether making care decisions on the basis of the results of screening is likely to offer more benefit than harm.

The decision to implement a screening approach in a clinical setting warrants consideration of the optimal (and most practical) time point for patient screening. Although obtaining accurate prognostic information may be paramount, early identification of high-risk individuals is also important.[23] In primary care settings screening appears to be less accurate if it occurs within the first 3 weeks after pain onset,[32] and preferable at 12 weeks compared with 6 months.[27] To our knowledge, the optimal time point for patient screening in secondary care settings has not been investigated.

We aimed to determine whether screening patients with LBP who have recently been referred to secondary care could provide accurate and useful information about prognosis. Specific objectives were to: 1) evaluate the discriminative performance of the PICKUP,[42] the SBT,[14] and the OMPSQ-s[25] for determining 'poor outcome' at 4-month follow-up, 2) describe and compare their clinical value, and 3) investigate whether participant pain duration at baseline influences discriminative performance.

Methods

Study Design

This was a prospective, longitudinal cohort study involving consecutive participant recruitment. The human research ethics committees at the Royal Adelaide Hospital and the University of South Australia both granted approval for the investigation. The study protocol was prospectively registered and locked on Open Science Framework (https://osf.io/dashboard) and can be accessed at: https://osf.io/ctyed. The design of this study was informed by the Prognosis Research Strategy (PROGRESS) framework for prognostic model research.[39]

It is recommended that for studies validating prognostic instruments, the sample size must be sufficient to identify at least 100 adverse events.[5,28] Sample size estimations for this study were informed by a study of 960 participants attending an outpatient spinal secondary care setting in Denmark.[31] In that cohort, 69% of participants experienced the 'poor outcome' (defined as a disability score of ≥30%), which suggested a minimum sample for the present study of 150 participants.

Setting and Participants

This study was conducted in the Spinal Outpatient Clinic of the Royal Adelaide Hospital, Adelaide, Australia. The spinal clinics provide a specialized, secondary care, consultative service, most frequently attended by patients with LBP who have failed to make satisfactory progress in primary care. These clinics are led by spinal surgical consultants, spinal fellows, and advanced practice physiotherapists. More than 95% of referrals to the clinics are received from general practitioners, servicing a catchment area covering the central and northern regions of the Adelaide metropolitan area and country South Australia (approximately 900,000 km^2).

Patients were eligible for inclusion if they were aged between 18 and 75 years, were English-speaking, and had been referred to the spinal unit with LBP, with or without leg symptoms. Clinic referrals were predominantly received via a facsimile template that categorized the patient's pain duration as: 0 to 6 weeks, 6 to 12 weeks, 3 to 9 months, 9 months to 2 years, or >2 years. All eligible patients were required to have referrals reporting a pain duration of <9 months. This criterion was selected for reasons of practicality (the categorization was consistent with the current referral template options) and to identify patients with 'recent onset' LBP. Because most referrals to the Spinal Outpatient Clinic are for patients with long-term complaints (>2 years), patients meeting this criterion were regarded as 'recent onset' for this cohort. Referrals indicating that an interpreter was required for the patient consultation (ie, non-English speaking patients) were excluded because of anticipated difficulties with the study procedure