

HEALTH SERVICES RESEARCH

Testing a New 10-Item Scale (Pind's LBP Test) for Prediction of Sick Leave Lasting More Than Three Days or More Than Two Weeks After a General Practitioner Visit for Acute Low Back Pain

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Study Design. A study on acute low back pain (LBP) in consecutive working patients in a multicenter study in general practice.

Objective. LBP costs are enormous in all countries. New guidelines are difficult to introduce. On the basis of a new, specially developed LBP scale, the aims were to predict the duration of sick leave (SL), and to examine if the guidelines concerning bed rest (BR) and referral to radiographical examination were followed.

Summary of Background Data. Pain intensity and heavy work influence the course of SL. A finger-to-floor distance test assesses the mobility of the spine, and both the finger-to-floor distance test and the straight leg raising test (SLRT) can be used to predict the course of LBP. BR or waiting time for treatment or referral will prolong SL. The expectations of patients and general practitioners are strong outcome predictors as is information about the prognosis.

Methods. A user-friendly 10-item questionnaire was specifically developed. The scale included the background date. From a predefined scale the patients were subgrouped into 3 categories in relation to SL: (1) "no SL" or "a few days of SL," (2) "1 week of SL," and (3) "more than 2 weeks of SL." The Fisher exact test was used to compare categorical variables.

Results. Twenty-three doctors examined 207 working patients. A total of 114 patients (56%) completed the follow-up questionnaire. The 10-item scale showed a good correlation between the total score at the first general practitioner visit and predictable time of SL according to the 3 periods.

The frequency of BR and referral to radiographical examination was low, and perhaps this was a consequence of using the scale.

Conclusion. The specially developed short and user-friendly 10-item LBP scale was a good predictor of the duration of SL. A low rate of BR and radiographical examination may even be the result of using the scale.

Key words: lumbar rating scale, low back pain (LBP), general practice, sick leave (SL), predictor, heavy work, finger-floor-distance (FFD), straight leg raising test (SLRT), bed rest (BR), physiotherapy, referral, expectations of doctor, expectations of patient, guidelines.

Level of Evidence: N/A

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During the past 30 years, low back pain (LBP) has become a growing problem. Estimates of the economic costs in different countries vary greatly depending on study methodology but by any standards must be considered a substantial burden on society.¹ Many national and international guidelines have been created to address this challenge.² Predictors of LBP in relation to sick leave (SL) have been found,³ and many different screening tools/questionnaires are available, for instance Oswestry Disability Index,⁴ Roland-Morris Disability Questionnaire,⁵ Orebro Musculoskeletal Pain Questionnaire,⁶ Fear-Avoidance Beliefs Questionnaire,⁷⁻⁹ and scales for assessing LBP have been developed: Quebec Task Force Classification,¹⁰ Hill and Dunn,¹¹ Acute Low Back Pain Screening Questionnaire,¹² and Screening Questionnaire for Predicting Outcome in Acute and Subacute Back Pain.¹³

Intervention strategies for early disability risk factors may be helpful in identifying the patients at greatest risk of delayed recovery. These patients can be identified by focusing on job factors, pain coping strategies, recovery expectations, back specific function, generic health status, work disability, and patient satisfaction.¹⁴ The latest review states that the most helpful components for predicting persistent disabling LBP are maladaptive pain coping behaviors, nonorganic signs, functional impairment, general health status, and presence of psychiatric comorbidities.¹⁵

A systemic literature search has shown that the developmental stage of most prediction models is preliminary, and the study quality is often moderate.¹⁶

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A distinct limitation of the current Multinational Musculoskeletal Inception Cohort Study Statement is the length and complexity of the battery of questionnaires. This may deter researchers from using the statement and might impact on the willingness of the patients to take part in studies.¹⁷

Moreover, there is a gap between what should be done, and what is actually done in clinical practice.¹⁸

The aims of this study were as follows:

- To test a specially developed short and user-friendly 10-item LBP scale for possible duration of SL in patients with acute LBP—without making a specific diagnosis. From the scale it will be possible to detect the most relevant items in relation to each patient.
- To assess if the gap between guideline recommendations and normal daily practice in relation to staying active, BR, and referral to radiographical examinations could be minimized by using some of the specific questions in the test in relation to our pilot study results with 91 patients 4 years earlier.

MATERIALS AND METHODS

The testing of the scale was organized as a multicenter study with 23 participating general practitioners (GPs) from the Central Denmark Region. The participation was voluntary for the patients. The project was approved by the Danish Data Protection Agency.

A user-friendly 10-item scale was developed for the study, and the doctors were given written instructions in the use of the scale.

The development of the 10-item scale was based on an earlier pilot study with 91 patients combined with the literature as follows (Table 1):

1. *Subjective symptom.* Pain intensity has been shown to belong to the strongest determinants of prolonged SL.¹⁹ In our pilot study 100% of the patients were on SL lasting for more than 3 days if the pain intensity was more than 5 (VAS, 0–10), sciatic pain did not specially influence the duration of SL. Pain was graded from 0 to 10; where “0” indicated “no pain,” “3” “some,” “6” “much,” “8” “intense,” and “10” indicated “invalidating.”
2. *Heavy work* is a prognostic factor for extended SL. In our pilot study 32% of the patients were on SL due to heavy work, but not for more than 3 days in a conclusive way. The amount of heavy work was graded from 0 to 10; where “0” indicated “very light work,” “3” “less heavy,” “6” “heavy,” “8” “more heavy,” and “10” indicated “very heavy.”
3. *Objective signs.* Finger-to-floor distance (FFD) test is a valuable measurement tool of trunk mobility.²⁰ In our pilot study, the FFD would, if it exceeded 25 cm at the first visit increase the rate of individuals on SL to more than 69%, but not statistically. “FFD < 10 cm” was “0,” “FFD 10–25 cm” was “4,” “FFD 25–45 cm” was “7,” and “FFD > 45 cm” was “10.”
4. *Objective signs.* Straight leg raising test (SLRT). In patients with radiating symptoms, the nerve root compression was predicted by increased FFD and by SLRT.²¹ In our pilot study 100% would report SL in relation to SL lasting for more than 3 days if SLRT at the first contact was positive less than 30°. “SLRT > 60” was “0,” “SLRT from 30 to 60” was “5,” and “SLRT < 30” was “10.”
5. *Bed rest.* BR made little or no difference compared with exercises or physiotherapy,²² nor did 7 days of BR make any significant difference compared with 2 to 3 days.²³ Bed-bound patients are a predictor for SL lasting for more than 3 days. Although not recommended, 26% of the patients took bed rest (mean time, 5–6 d) irrespective of sciatic pain in the leg in our pilot study. “BR” was given “10” and “no BR” was rated “0.”
6. *Physiotherapy.* Previous treatment by physiotherapists has been shown to be a risk factor for long-term SL in patients with subacute back pain.²⁴ “Referral to physiotherapy” was given “5” and “no referral” was rated “0.”
7. *Referral to radiographical examination.* The guidelines recommend that clinicians do not routinely refer patients with LBP to immediate lumbar imaging, but this recommendation is not followed.¹⁷ An early referral to radiographical examination irrespective of more serious symptoms and signs is statistically a predictor for SL lasting more than 3 days.²⁵ In our pilot study 15% underwent a radiographical examination. “Referral to radiographical examinations” was given “10” and “no referral” was “0.”
8. *Patient expectations.* Recovery expectations are measured using a time-based, specific-item tool strongly predicting the work outcome.²⁶ Eliciting patient expectations for improvement may be a simple way to identify patients with the highest (or lowest) likelihood of experiencing functional improvement.²⁷ It is not a question of psychiatric illness, but due to the influence of factors like behavior, attitudes, coping, and stress as well as social and cultural aspects. Patient expectations of the duration of SL were evaluated on a 0 to 20 numerical scale; “no SL” was given “0,” “SL for a few days” was “3,” “SL for 1 week” was “5,” and “SL for more than 2 weeks” was rated “20.”
9. *GP expectations.* An overall assessment by the GPs seemed to be the most important predictor associated with the long-term outcome.²⁸ GP expectations of the duration of SL were also evaluated on a 0 to 20 numerical scale. No SL was given “0,” SL for a few days was “3,” SL for 1 week was “5,” and SL for more than 2 weeks was rated “20.”

A total score for the first 9 items was calculated, and the patient was informed about the possible prognosis from the predefined scale (elaborated in the text hereafter).

10. *Information about the prognosis.* There are barriers to patient information given for LBP that need to be addressed to close the gap between strategy and implementation.²⁹

TABLE 1. LBP-Rating Scale by Pind for Duration of LBP

Intensity of pain, 0–10
Heavy work, 0–10
Finger-to-floor distance, 0–10
Straight leg raising test, 0–10
Bed rest, 0–10
Referral to treatment, 0–5
Referral to radiographical examination, MR, or specialist, 0–10
Patients expectance of duration, 0–20
Doctors expectance of duration, 0–20
Satisfaction with explanation of duration day 1, 0–10
Total score
<i>For more details: refer text. LBP indicates low back pain; MR, MR-scanning.</i>

The satisfaction with information about the prognosis was scored on the 0 to 10 scale, but in the reverse order with “0” representing “maximum satisfaction,” “3” representing “very pleased,” “5” representing “satisfied,” “8” representing “satisfied to a low extent,” and “10” representing “minimum satisfaction.”

The 10 indicators were assessed and filled in a questionnaire booklet at the first consultation by the GP.

A scoring system from 0 to 10 for all 10 items would have been ideal. But in a tentative way, the score 5 was chosen in relation to physiotherapy referral because of lack of specific data,²⁶ and maximum 20 for patient and doctor expectation because of the earlier shown severity of these 2 factors.³⁰

The scores for all 10 items were pooled; and from the total score the patients were subgrouped from a specially developed final scale into the following 3 categories (Table 2):

- (1) A total of 0 to 20 points would predict no SL or “short SL”; that is, only a few days.
- (2) A total of 21 to 40 would predict “medium SL”; that is 1 week.
- (2) More than 40 points would predict “long SL”; that is exceeding 2 weeks.

In the follow-up study, the patients at home filled in the rest of the questionnaire concerning the duration of the SL on the fourth day after the consultation, and after 2 and 7 weeks. These sequences were chosen as they reflect the Danish standard for reporting and handling of SL. In Denmark, the employer can demand a medical certificate after the third day of SL and is required to pay the SL for the first 2 weeks. Thereafter, the municipality takes over the SL payment. Seven weeks mark the end of the acute period of LBP. At that time all patients were asked to state the extent of SL, if any, and whether they had been bed-bound or radiographically examined.

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TABLE 2. Total Score in Relation to Expected Duration of Sick Leave

Score		
0–20	No	“No” or just a few days
21–40	Shorter	1 wk
>40	Longer	2 wk or more

Inclusion Criteria

The study included consecutive, job-active patients aged 18 to 67 years who contacted their GP for the first time during the course of their acute back trouble, irrespective of it being their first or a recurrent attack of LBP.

Exclusion Criteria

Pregnant females and patients experiencing any well-known malignant diseases or fractures were not included. Patients could only be included once in the study.

The data were collected during the period August 1, 2007, to June 30, 2008.

Statistics

The Fisher exact test was used to compare categorical variables. The associations between “SL > 3 d/>2 wk” and SL were calculated as prevalence ratios (PR) in a generalized linear model with log link for a binomial outcome.³⁰ Calculations were made of the crude PR. *P* < 0.05 was considered statistically significant.

Data were analyzed using STATA 10 (Stata Statistical Software, Release 10, StataCorp LP, College Station, TX).

RESULTS

Thirty GPs wanted to participate in the study, 23 GPs included patients. The inclusion rate for the GPs was from 1 to 20 patients. Every second month, the doctors were reminded by E-mail to include patients.

A total of 202 patients were included. Not all patients returned the booklet of questionnaires although they received a reminder by post. Some of the patients did not comply with the inclusion criteria, and some of the patients as well as doctors did not complete all the questions in the booklet. A total of 122 questionnaires (60%) were returned, but only 114 patients (56%) fulfilled the criteria for analysis. Fifty-nine patients were males (54%); mean age was 42.0. Unfortunately, owing to the lack of baseline information from the questionnaire, it was unknown whether patients who completed the study differed from those who did not.

Tables 3 and 4 show the total scores of SL in the 3 groups in relation to taking SL for more than 3 days or for more than 2 weeks. For more than 3 days of SL, the score “0–20” indicated a PR of 0.30 (95% CI, 0.07–1.22), and “score >40” indicated a PR of 4.3 (95% CI, 2.64–7.0). For more than 2 weeks of SL a score of “0–20” indicated PR of 0, and “score >40” indicated a PR of 7.75 (95% CI, 2.84–21.11).

TABLE 3. Impact of Total Score on Sick Leave More Than 3 Days

Univariate Analysis							
Total Score	N = 114	%	N = 60	%	PR	95% CI	P
0–20	32	28.1	2	6.3	0.30	0.007–1.22	0.092
21–40	71	62.3	15	21.1	1		
>40	11	9.7	10	90.9	4.30	2.64–7.00	0.000

*N = 60 = total number of patients on sick leave.
A score >40 is a strong predictor of a SL for more than 3 days.*

In this way a score more than 40 is a strong predictor of a SL for more than 3 days as well as 2 weeks.

In relation to our pilot study 4 years earlier, radiographical diagnostics in the 2 different set-ups decreased from 15% to 6%, a relative decrease of 60%. The total numbers of radiographical examinations of the lumbar back in the same region rose by 9% in the same period. The amount of bed-bound patients changed from 26% to 1%.

DISCUSSION

Most patients with LBP recover in a short time. Only 10% of the patients seeking primary care are at risk of taking SL lasting more than 2 weeks (our pilot study), therefore it is of interest to identify risk factors, “red flags” and “yellow flags.”³¹ Red flags are clinical indicators of possible, seriously underlying conditions requiring further medical intervention. Yellow flags are psychosocial indicators like depression and maladaptive pain-related coping strategies suggesting an increased risk of progression to long-term distress, disability, and pain.

In a workshop, participants were given cards that represented the most important prognostic factors for returning to work, and after discussing the importance of each factor Steenstra concluded, that there were discrepancies between research and practice. There were strong evidence only for pain and workplace modified duties, but great practice importance due to psychosocial factors, fear-avoidance beliefs, work-relatedness of back pain, fear of movement, depression, treatment-related content, and workplace psychosocial factors.³²

In our pilot study 4 years earlier, half the doctors participated in an interactive workshop and they were given in a

short written manual the newest guidelines about handling patients with LBP in relation to SL, BR, and referral to radiographical examinations. The other group of the doctors performed as usual. In the observation period the intervention did not make any changes in relation to SL, bed rest, or referral to radiographical examinations.

The hope for our scale was therefore to create a simple user-friendly scale that could help the GPs to predict the duration of SL at the initial consultation in relation to only 2 subjective symptoms: intensity of pain and degree of heavy work; 2 signs: FFA and SLRT. And to minimize BR and referral to radiographical examinations as well as physiotherapy.

Scales are well-known in relation to other illnesses. The mini-mental state examination or Folstein test is a brief 30-point questionnaire test that is used to screen for cognitive impairment in dementia.³³ In the same way, the Hamilton 10-item test for depression gives information about the severity of a depression and makes it possible to follow the course of the depression over time.³⁴

The mini-mental state examination and Hamilton test are well known for all GPs. But GPs do not use scales for LBP in daily practice, and their beliefs do not correlate with LBP guidelines.³⁵

From our new scale, the GPs acquired data to back up their arguments declining patient requests for irrelevant, or perhaps even counterproductive, measures.

Nearly two-thirds of the patients incorrectly think that LBP is often due to a slipped disc or trapped nerve, and most patients expect to undergo a radiographical examination,¹⁸ and the problem of managing back pain may be reduced by closing the gap between patient expectations and what is recommended in the available guidelines.¹⁸

TABLE 4. Impact of Total Score on Sick Leave More Than 2 Weeks

Total Score	N = 114	%	N = 60	%	PR	95% CI	P
0–20	32	28.1	0	0.00			
21–40	71	62.3	5	7.00	1		
>40	11	9.7	6	54.6	7.75	2.84–21.1	0.000

*N = 60 = total number of patients on sick leave.
A score >40 is a strong predictor of a SL for more than 2 weeks. SL indicates sick leave.*

The strategy with penalty points for BR and referral to radiographical examination seemed to lower the number of patients on SL in relation to what we saw in our pilot study. Of course, many factors could have been the reason, including a general change in practice during the 4-year period, but our data do not suggest any fraught with important biases that would prevent our results from being extrapolated to daily use of this new 10-item scale.

Patient and GP expectations were noted from 0 to 20 points to show the importance of expectations. By using the scale, the GPs became aware of the opportunity to discuss why some patients expected a SL for several days and the relevance of this. In the workshop by Steenstras, people have heard how important psychosocial factors are, but unfortunately it is not very clear what those factors are. In a systemic review, negative recovery expectations are 2 times greater than for those with more positive expectations.³⁶

The beliefs of doctors were shown for rheumatologists in the following way; if physicians have a high Fear-Avoidance Beliefs Questionnaire physical score, they will be less likely to follow the guidelines on prescribing rest and occupational activity for LBP.³⁷

Patient beliefs about LBP at work will also influence their returning to work.³⁸

The expectations of patients will influence what actually occurs. Therefore, it is important to understand the patients' expectations, beliefs, and situation when working with human beings.

Patient satisfaction with the prognostic information given was chosen as a relevant item to ensure the GP's explanation and discussion of the expected course of the attack.

Without diagnosing the illness of patients, the scale showed potential for helping predict length in relation to the duration of SL, and by using the total score of the 10-item scale, it was possible to compare the expectations with the actual outcome and the key.

The sampling period had to be prolonged to more than the pre-estimated 3 months due to slow and low inclusion rate. Therefore, the patients may not have been included in a consecutive manner. This aspect may have affected the outcome.

The responding rate was 60%, but only 56% (114 patients) fulfilled the criteria for analysis because of incomplete questionnaires. This aspect may also have affected the outcome.¹⁷

The scale needs validation in an RCT study.

CONCLUSION

A new screening 10-item tool was a promising instrument for identifying subgroups of LBP patients in relation to SL. From this scale, it was possible to predict the length of SL and to identify patients in group-level associations at risk of exceeding a 3-day SL period and a 2-week SL period. The strategy enables the doctors to inform about the prognosis in detail, and it seems to prevent unnecessary BR and referrals.

Instead of focusing on red flags and yellow flags, the focus could be on the green flags, which is on the majority of patients (90%) with no predictors of bad outcome who

could stay active and "wait and see." For the last 10% of the patients red- and yellow-flag symptoms could be considered.

In most cases, referral to examination and treatment may be postponed until after an initial period of 2 or perhaps 4 weeks of trying to remain as active as possible and avoiding BR.

Perhaps in daily practice, even new assessments every second week may be of benefit and may lead to improvements in patient outcomes and a reduction in health care costs.

➤ Key Points

- ❑ For prediction of the duration of SLs in patients with acute lumbar back pain, a new user-friendly 10-item rating scale was specially developed for the study and found useful.
- ❑ The growing focus in general practice on the handling of patients with LBP has brought down the number of individuals reporting SL. Forty-eight percent of the patients reported SL for less than 4 days, 10% for less than 2 weeks, and only 4% for more than 7 weeks.
- ❑ A small rate of referral to radiographical examination and BR was observed. This could be an effect of using the 10-item rating scale.

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