






A clinical prediction rule predicted outcome in patients with low back pain having spinal manipulation and exercise treatment

Childs JD, Fritz JM, Flynn TW, *et al.* A clinical prediction rule to identify patients with low back pain most likely to benefit from spinal manipulation: a validation study. *Ann Intern Med* 2004;**141**:920–8.

Clinical impact ratings GP/FP/Primary care ★★★★★☆☆ Rheumatology ★★★★★☆☆

Q In patients with low back pain (LBP), does a clinical prediction rule predict outcome of spinal manipulation?

METHODS

-  **Design:** a randomised controlled trial to validate a previously developed clinical prediction rule for predicting outcome of spinal manipulation.
-  **Setting:** 8 physical therapy clinics in 2 academic medical centres and outpatient practice settings in the US.
-  **Patients:** 131 patients who were 18–60 years of age (mean age 34 y, 58% men), had a primary symptom of LBP, were referred to physical therapy, and had an Oswestry Disability Questionnaire (ODQ) score $\geq 30\%$. Exclusion criteria: serious spinal condition, nerve root compression, pregnancy, or previous surgery to the lumbosacral spine or pelvis. Patients were allocated to receive spinal manipulation plus exercise (n=70) or exercise alone (n=61) given by a physical therapist for 4 weeks.
-  **Description of prediction guide:** the clinical prediction rule criteria were (1) LBP symptom duration <16 days, (2) no symptoms distal to the knee, (3) Fear Avoidance Beliefs Questionnaire work subscale score <19 points, (4) ≥ 1 hypomobile segment in the lumbar spine, and (5) ≥ 1 hip with >35 degrees of internal rotation range of motion. Patients were classified as “positive” (likely to respond to spinal manipulation) if ≥ 4 of the 5 criteria were met. Patients were classified as “negative” if they had positive status on ≤ 3 of the 5 criteria.
-  **Outcomes:** disability, measured by modified ODQ score (score range 0% to 100%), and treatment “success”, defined as $\geq 50\%$ improvement in ODQ score, assessed at 1 week (100% follow up), 4 weeks (99% follow up), and 6 months (70% follow up).

MAIN RESULTS

In patients who received spinal manipulation plus exercise, those who were positive on the rule (23 of 70 [33%]) had greater

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Positive v negative status on the spinal manipulation clinical prediction rule in patients with low back pain

Intervention	Follow up	Difference in modified Oswestry Disability Questionnaire (ODS) score change* (95% CI)	p Value
Manipulation plus exercise	1 week	15.0 (8.5 to 21.5)	<0.001
	4 weeks	15.2 (7.1 to 23.3)	<0.001
Exercise alone	1 week	-1.9 (-8.6 to 4.9)	>0.2†
	4 weeks	6.5 (-1.8 to 14.8)	0.127†

*Higher ODQ scores represent larger improvements in disability.
†Not significant.

improvement in 1 week and 4 week disability than those who were negative on the rule (47 of 70 [67%]) (table). Positive status on the rule had a positive likelihood ratio of 13 (95% CI 3 to 52) for predicting treatment “success” at 1 week. In patients who received exercise alone, patients who were positive on the rule (24 of 61 [39%]) and those who were negative on the rule (37 of 61 [61%]) did not differ for 1 week or 4 week disability (table).

CONCLUSION

A clinical prediction rule predicted outcome in patients with low back pain receiving spinal manipulation and exercise treatment but not in patients with low back pain receiving exercise treatment alone.

Commentary

This study by Childs *et al* presents interesting data suggesting that an identifiable subgroup of patients with back pain may benefit from adding spinal manipulation to an exercise treatment. The clinical prediction rule was developed in a previous cohort study of patients receiving manipulatory treatment after referral for physical therapy.¹ Several of the prediction rule’s components identify a group of patients who are likely to do well regardless of treatment. In this new study, the prediction rule was again tested on patients referred for physical therapy.

The current study was designed to test for a 3 way interaction between patients’ status on the rule, their treatment group allocation, and outcome at 1 week. This relationship was statistically significant, showing that both status on the prediction rule and treatment contribute to clinical outcome, which supports the hypothesis that the prediction rule specifically identifies those who will benefit from additional manipulation. However, the strength of this interaction and its statistical significance are not stated. The effect sizes presented are post hoc analyses that need cautious interpretation. As expected, the rule predicted outcome in those who received spinal manipulation. Additionally, those who were positive on the prediction rule and received manipulation did substantially better than those who received exercise only, suggesting that the rule could be used to guide treatment choices. However, using this rule to decide on referral for physical therapy including manipulation may be impractical for those unfamiliar with assessing fear avoidance beliefs or lumbar hypomobility with spring testing.

In conclusion, this prediction rule appears to be a promising approach for identifying subgroups of patients with back pain. However, what would now be helpful is a further study that is able to replicate these findings, using a more practical version of the tool in the situation in which it will be used, with more robust analyses presented. Based on such results, a more rigorous determination on the application of this rule in routine clinical practice will be possible.

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1 Flynn T, Fritz J, Whitman J, *et al.* A clinical prediction rule for classifying patients with low back pain who demonstrate short-term improvement with spinal manipulation. *Spine* 2002;**27**:2835–43.