

The Bottom Line

The Bottom Line is a translation of study findings for application to clinical practice. It is not intended to substitute for a critical reading of the research article. Summaries are written by members of The Bottom Line Committee or by invitation of the Editor in Chief.

[Cleland JA, Childs JD, Fritz JM, et al. Development of a clinical prediction rule for guiding treatment of a subgroup of patients with neck pain: use of thoracic spine manipulation, exercise, and patient education. *Phys Ther*. 2007;87: 9–23.]

What problems did the researchers set out to study, and why?

No clinical guidelines currently identify the type of neck pain that is likely to benefit from thoracic spine manipulation. Likewise, no studies have investigated the predictive validity (strength) of variables collected during the initial examination. The purpose of this study was to develop a clinical prediction rule (CPR) that identified patients with neck pain who were likely to benefit from a thoracic spine thrust manipulation. A CPR quantifies the collective contribution of various components of examination results that are involved in decision making related to the diagnosis, prognosis, or likely response to treatment for an individual patient.

Who participated in this study?

Seventy-eight subjects from an outpatient physical therapy site who had mechanical neck pain (mean age=42 years, SD=11.3). Four physical therapists (mean years of experience=12.3 years, SD=10) were involved in examination and treatment. Each physical therapist received standardized training prior to the study to ensure that study procedures and data collection were consistent.

What new information does this study offer?

The study identified 6 variables that were useful as a combination in identifying patients who were likely to benefit from thoracic spine thrust manipulation: (1) symptom duration of less than 30 days, (2) no symptoms distal to the shoulder, (3) subject reports that looking up does not aggravate symptoms,

(4) Fear-Avoidance Beliefs Questionnaire physical activity score of less than 12, (5) diminished upper thoracic spine kyphosis at T3 to T5 (measured as a visually assessed flattening of the kyphosis), and (6) cervical extension of less than 30 degrees. When appropriate, the authors reported reliability, sensitivity, specificity, and likelihood values for each of the 6 examination variables. Reliability values reflected adequate reproducibility. The findings suggested that if patients in this study exhibited 4 of the 6 variables during the examination, there was a 93% probability of successful outcome as measured by patient report using thoracic spine thrust manipulation.

How did the researchers go about the study?

The prediction study applied a standardized treatment protocol and assessed the outcome. Data analyses involved regression modeling and chi square analysis of examination variables to determine potential predictor variables. Once explored, the variables were analyzed for diagnostic accuracy and were further evaluated (using stepwise logistic regression) to identify the most accurate set of predictor variables. For a more complete description of the data analyses associated with a CPR by 2 of the authors of this study (Childs and Cleland), the January 2006 issue of *Physical Therapy*¹ is a recommended read.

How might the results of the study apply to the practice of physical therapy?

The authors outlined 2 significant applications of the CPR. First, the CPR had the ability to appropriately

identify patients during the examination who were likely to experience an early success with thoracic spine thrust manipulation. Second, the results suggested that, under certain circumstances, a thoracic spine thrust manipulation is effective on a population of patients with mechanical neck pain. The findings provide preliminary support for the use of thoracic thrust manipulation in situations where the potential risks of cervical spine manipulation outweigh the benefits of the intervention.

What are the limitations of the study, and what further research is needed?

As the authors indicated, this study is the first step in developing and testing a CPR, and further validation testing is required. Furthermore, the study was performed at one clinic and may have involved a homogenous group of patients with neck pain. Outcome was examined only during visits 2 and 3 after intervention; additional study is necessary to examine long-term effects. Finally, although no differences in outcomes were noted among the 4 clinicians, future studies should analyze variations across a larger number of clinicians.

References

1 Childs JD, Cleland JA. Development and application of clinical prediction rules to improve decision making in physical therapist practice. *Phys Ther*. 2006;86(1):122–131.