

Evidence-Based Spinal Rehab? Critical Examination of Biomechanical and Postural Approaches

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With the incidence of chronic back pain rapidly rising despite increased spending directed at the problem, everyone involved in treating these patients should question whether we are using valid and effective approaches that add value instead of further contributing to the problem.¹⁻² Before being critical of the many other approaches to treating back problems, we should first make sure that our own practices are aligned with the current evidence. One glaring example in spinal rehabilitation is postural and biomechanical paradigms, which have repeatedly failed validation for spinal pain, yet continue to be widely recommended and employed, especially by chiropractors and physical therapists treating these problems.

It is not known what fraction of providers still subscribe to a biomechanical / postural approach to back problems, but based on my observation, a survey on continuing-education courses, and recent studies showing continued poor guideline adherence, it would appear to be a large majority.³⁻⁴ While exercise is a universally recommended treatment approach for back pain, no consensus exists on the optimal type of exercise. It appears that tailoring the approach to match patient characteristics is important, but selecting a valid way to do this has been a formidable challenge for rehabilitation providers.⁵ Let's examine two of the most common approaches so providers can be aware of their shortcomings before embracing them.

Biomechanical Approaches: The Functional Movement Screen



First, consider a [biomechanical](#) approach, perhaps the most popular one currently, called the Functional Movement Screen (FMS). I was exposed to a variation of these "functional" tests a decade ago in the chiropractic rehabilitation diplomate program. *ACA News* ran a recent series of articles enthusiastically recommending the screening tests that comprise the FMS and are purported to identify biomechanical / functional issues, and therefore improve performance, prevent injury or guide rehabilitation. In the articles, the author says that clinicians are making the shift "to provide the best screening and evaluation tools, and therefore treatment outcomes, to

their patients," and calls the FMS "a great tool to evaluate patients."⁶ It was not specified whether the screening tests are being blindly recommended or if there are patient populations, situations or conditions for which they might be more valid.

The same week I read the articles, a physical therapy clinic in my town advertised the FMS as a way to predict and prevent injury, improve athletic performance, and move more efficiently (whatever that might mean).⁷ After hearing these endorsements, I thought the FMS warranted further investigation.

I went to the Web and noticed that the major FMS site was a little more conservative and vague in making claims, stating that the screen may never be able to determine injury risk in a layperson and that future research should focus on identifying whether using it as a baseline in a rehabilitative setting can be useful in predicting subsequent injuries.⁸ The limited research done to date is not promising in terms of any widespread ability to identify injury risk, improve performance or guide rehabilitation, the three domains with which most of us would be concerned.

The most recent study suggested that "FMS is not an adequate field test and does not relate to any aspect of athletic performance."⁹ Okada also reported that there were no significant correlations between [the FMS](#) and core stability, and that neither of these was a strong predictor of performance on the measures they assessed.¹⁰

It is hypothesized that a "non-functional" movement pattern identified on the screening tests can predispose for injuries. However, research to try to establish normative values for these tests found no significant difference in scores between those who reported a previous injury and those who did not, suggesting poor discriminative ability.¹¹ We need to have valid and reliable ways to first define, then measure non-functional movement, followed by establishing clear reference standards based on normative data. This is how evidence-based medicine operates; until this research is done for functional movement screens to establish their role in both preventing and rehabilitating spinal problems, we would be wise to postpone adoption of these screens for these populations.

Application of unvalidated screening tests distracts from evidence-based care while adding cost. Tests that screen for injury risk like the FMS purports to do should have high validity so that they help, rather than hurt people. Otherwise, mislabeling someone as high risk for injury could induce fear of movement, which is strongly associated with chronic back pain and the last thing to which we would want to inadvertently contribute.¹²

Rehabilitating Posture

Similar to biomechanical approaches is spinal rehabilitation based on [posture](#). The idea that poor posture contributes to back / neck pain, and that we should try to rehabilitate posture, has been around for a long time and continues to be very popular, yet we have still been unable produce any good evidence to support this model.¹³⁻¹⁴ Providers and even continuing education, including two recent seminars in my area, one by a physical therapist and another through a chiropractic college, continue advocating for a postural rehabilitation approach.^{4,15} Rather, existing evidence supports rehabilitation using a biopsychosocial model over a traditional biomedical (i.e., posture and body mechanics) model, but a biopsychosocial model has been very slow in adoption for back pain.¹⁶⁻¹⁷

Postural-based approaches to back pain have been found ineffective and recommended against in a number of studies and guidelines, in part because they can convey negative messages to patients

about back pain.¹⁸⁻¹⁹ For example, back schools largely based on anatomy and postural education have been shown ineffective in multiple systematic reviews and less effective than spinal manipulation, but equally effective to physical therapy in a recent trial.^{17,20}

The idea that we can change our posture via exercise is simplistic and attractive, but contradicts current evidence.²¹ The relationship between posture and back pain is complex and we don't even have a consensus on a valid definition of good posture or a reliable way to measure it, as common measures show poor reliability with many inherent factors that can contribute to variability.²²⁻²³ We also lack convincing research to support that "improving" posture will result in corresponding improvement in spinal pain.^{19,24}

The correlation between posture and pain is tenuous at best, with most studies suggesting no relationship.^{18,24-25} Therefore, the therapeutic investment in correcting postural and biomechanical factors is irrational, since it is unlikely to influence the course of a patient's spine condition.¹⁸

Evidence-Based Strategies

Rather than being based on tradition and theory, evidence-based spinal rehabilitation should focus on factors that are actually associated with back pain as well as amenable to change through rehabilitation. The association of biomechanical risk factors and lifting techniques with risk of back pain is a persistent myth, even though prospective studies have not found that interventions aimed to improve ergonomics reduce the risk of back pain.^{14,19} Conversely, behavioral and fear-avoidance-based rehabilitation programs have been shown to have greater efficacy than usual care.^{5,19}

Postural and biomechanical approaches to spinal rehabilitation provide examples of the importance of critically examining our methods to make sure they are in line with current evidence. Facing up to the science may require discarding some of long-held assumptions and beliefs and embracing a biopsychosocial model over a biomedical one. If we rigorously apply the best evidence to our spinal rehabilitation approaches, we have much-needed value to provide both to our patients and to the health care system.

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