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Letter to the Editor: Positioning Rasch Analysis in Modern Clinical Evidence Grading

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To the Editor: Dr. Morgan Lorio, the current Co-President of the International Society for the Advancement of Spine Surgery, solicited this letter to the editor to provide insights on the Rasch analysis research of clinical decision-making and patient outcomes. The core articles published in this special issue of the *International Journal of Spine Surgery (IJSS)* focus on modern minimally invasive spinal surgeries, aiming to identify high-value endoscopic spinal procedures. By examining the relationship between surgeon experience, surgeon skill, and patient values, the research seeks to enhance the determination of clinical outcomes and identify high-value solutions. The authors of the five core articles in this special issue emphasize the importance of integrating these factors not only to validate innovative surgical techniques but also to ensure that patient-centered care remains at the forefront of clinical advancements in spine surgery while maintaining surgeon autonomy and patient access to high-value care.

Before addressing how this research can be graded within the hierarchy of the classic pyramid of clinical evidence—which ranks systematic reviews and meta-analyses at the top, followed by randomized controlled trials (RCTs), cohort studies, case-control studies, cross-sectional studies, case reports and case series, and expert opinions at the bottom—I would like to introduce myself to the *International Journal of Spine Surgery* readership of spine surgeons. As Emeritus Professor of Psychiatry and consultant to the Neurosurgical Department at Keck School of Medicine, USC, I am deeply committed to addressing critical issues that affect patient outcomes, access to care, surgeon autonomy, and the training and credentialing requirements necessary to maximize clinical outcomes and overall quality of life while ensuring better stewardship of clinical resources.

Moreover, the psychometric analysis of experience and clinical judgment is deeply intertwined with

psychiatry, where understanding the complex emotions and cognitive processes that influence decision-making is crucial. Psychiatrists rely on psychometric tools to measure and interpret the intrinsic dynamics of human behavior, emotional responses, and thought patterns. These insights are vital for making informed clinical decisions, tailoring treatments to individual patient needs, and improving therapeutic outcomes. The ability to quantify and analyze experiential data through psychometric methods allows spine surgeons to uncover underlying psychological factors rooted in experience and skill that drive clinical decision-making, ultimately fostering a more empathetic, personalized, and effective approach to patient care.

As a tenured professor at Western University of Health Sciences and a research professor at Claremont Graduate University, my work has primarily focused on clinical trials and clinical evidence, especially regarding brain injury in sports. As the current co-chair of the psychiatry subsection of the Society of Brain Mapping and Therapeutics, I work closely with neurosurgeons from around the world with a focus on the clinical therapeutic interaction between neurosurgery and psychiatry.

Throughout the various roles I've filled related to brain-injury medicine, psychiatry, and neuropsychiatry, I oversaw clinical trials exploring the connection between chronic pain and mental health conditions. This multidisciplinary approach has been vital in enhancing clinical outcomes for patients.

The editorial “Embracing Rasch Analysis for Enhanced Spine Surgery Outcomes—The Outsider’s Viewpoint” by Dr. Igor Elman on the five accompanying Rasch analysis studies in this special issue of the *International Journal of Spine Surgery* highlights the issues at play when discussing clinical outcomes with a specific surgical intervention—in this case, spinal endoscopy—from the inseparable issue of surgeon training, skill, and experience. Traditional clinical evidence discussion emphasizing the need for high-grade

clinical evidence, such as provided by RCTs to prompt protocol change for better patient outcomes and more efficient use of medical resources, implies that each surgeon will achieve similar outcomes when executing an established or novel spine procedure for a specific surgical indication. In reality, significant variation in training and skill impacts patients' postoperative course, surgical complications, and, ultimately, long-term outcomes concerning revision surgeries. The ultimate holy grail in the mind of public policymakers and decision-makers in charge of physician reimbursement is that patients exit the health care system after successful treatment and that utilization of services is minimal and not shifted to other health care sectors where high costs are incurred as a result of failure to cure.

In spine surgery, the costs of the surgery and the cost of revision surgery are high. Therefore, they are looked at with increasing scrutiny, which is reflected in the bundling of codes within an overall trend to lower pay. Whether these decreasing payments are designed to discourage spine surgeons from performing these costly operations or are part of a more extensive health care strategy is beyond the scope of this editorial. However, there is no doubt that these trends are playing out right now. The authors of this special issue are attempting to demonstrate higher-value spine care with modern technology applications to counteract these trends that may impact surgeon autonomy and patients access to care.

The findings from the International Society for the Advancement of Spine Surgery webinars underscore the value of surgeon-led assessments in identifying high-value procedures. Techniques such as endoscopic decompression and full-endoscopic interbody fusion exemplify how surgeon experience can drive the evolution of effective surgical practices. The global analysis of 3639 surgeons using the polytomous Rasch model demonstrates the power of this approach in refining our understanding of successful surgical interventions.

Rasch analysis offers a promising solution to these challenges by providing a detailed assessment of the relationship between surgeon experience and clinical outcomes. This method allows for a deeper understanding of how surgical skills and experience influence patient results, generating high-grade clinical evidence from observational studies. Integrating these insights into the traditional pyramid of clinical evidence enhances the depth and applicability of the evidence, bridging the gap between evidence-based medicine and real-world clinical practice. I suspect that spine surgeons will benefit from the publication of this research as its elegant simplicity gets straight to the heart of surgical

decision-making. Health policy makers in charge of reimbursement for and approval of new technologies always demand more tangible real-world data they can use when deciding where and how to assign resources to identify the high-value health care solutions of the future.

Rasch analysis data could be the crucial missing link between traditional clinical trial outcomes and the financial aspects of medicine. By leveraging real-world data and surgeon experience, Rasch analysis promotes equitable treatment opportunities and enhances health care delivery, particularly in underserved regions. Integrating Rasch analysis into the traditional hierarchy of clinical evidence can enrich RCTs, systematic reviews, and cohort studies by providing a rigorous method to quantify and compare surgeon experience, clinical judgment, and skill levels. This approach allows for a more comprehensive understanding of clinical outcomes and resource utilization, recognizing that surgical practice is not an exact science. Ultimately, it fosters more effective and efficient health care practices.

Dr Elman's editorial and the accompanying Rasch analysis studies represent a significant advancement in spine surgery. By addressing the limitations of traditional clinical trials and embracing innovative methodologies, we can better align surgical practices with the realities of clinical experience and patient needs. I commend the authors for their insightful contributions and look forward to seeing the continued impact of this work on our overlapping fields.

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