Introduction by the Series Editor

I think it is safe to say that the advent of clinical prediction rules has caused quite a stir in the orthopaedic physical therapy world. Clinical prediction rules are decision-making tools that contain predictor variables obtained from patient history, examination, and simple diagnostic tests; they can assist in making a diagnosis, establishing a prognosis, or determining appropriate management strategies.[1] In other words, clinical prediction rules are diagnostic, prognostic, or interventional/prescriptive. To date, the large majority of clinical prediction rules within the physical therapy literature are prescriptive in nature. Prescriptive clinical prediction rules are an exponent of the treatment-based system. In this type of diagnostic classification system, a cluster of signs and symptoms from the patient history and physical examination is used to classify patients into subgroups with specific implications for management.[2] As such it produces homogeneous subgroups where all subjects within that group are expected to respond favorably to a matched intervention. All orthopaedic physical therapists will be able to recall various systematic reviews and meta-analyses published in leading biomedical journals that have indicated that interventions that we know to be effective in our everyday clinical practice. These reviews are either no more effective than the standard of care or have an effect size similar to placebo interventions. A 2003 meta-analysis showing a lack of evidence for the use of manipulation in the management of patients with lower-back pain can serve as an often-referenced illustration.[3] Not that this finding should surprise us: If studies included in a systematic review or meta-analysis use no patient classification other than a broad category of nonspecific regional pain, the resultant heterogeneous study samples pretty much preclude finding real effects of even the most effective intervention.[4] Their ability to identify homogeneous subgroups immediately makes the development and validation of prescriptive

clinical prediction rules a priority for our profession. As *Clinical Prediction Rules: A Physical Therapy Reference Manual* shows, many researchers have indeed recognized this importance and the result is the impressive number of clinical prediction rules presented in this text.

So why has the development and application of clinical prediction rules, particularly prescriptive rules, led to such controversy in orthopaedic physical therapy? One obvious reason is the fear that such rules may lead to a loss of autonomy with regard to clinical decision making. In this context, the choice of the word *prescriptive* has been less than fortuitous. And, admittedly, this fear is grounded in reality. Colleagues have told me that some health care organizations instituted company-wide educational programs and policies that (inappropriately and prematurely) positioned the application of nonvalidated clinical prediction rules as the new standard of care. As with any research, there is the potential that interested third parties use their findings to inappropriately limit care and reimbursement. Another reason is that clinical prediction rules may seem hard to integrate with the mechanism-based classification system still used as the predominant paradigm by many orthopaedic physical therapists today. This paradigm is based on the premise that impairments identified during examination are the cause of musculoskeletal pain and dysfunction; interventions aimed at resolving these impairments are assumed to lead to decreased pain and increased function.[5]

Despite these concerns, why is this book a worthwhile text that should ideally be included in the professional library of all orthopaedic physical therapists as well as of other conservative musculoskeletal care providers? First, clinical prediction rules were never intended to replace mechanism-based decision making. As with all research, we need to take into account external validity, which means that we can only apply clinical prediction rule research to patient populations that are sufficiently similar to the populations in which the tool was developed or

validated. Acknowledging that the majority of clinical decisions will still be made using the mechanism-based paradigm, clinical prediction rules simply provide us with another tool for a specific subpopulation. Albeit that for this subpopulation it provides a higher level of support from research evidence than does reasoning using the mechanism-based paradigm. However, to appropriately use this extra tool in our clinical toolbox, we need to know about content and relevance to our clinical practice of the clinical prediction rule. Second, any clinician will want to guard against misinterpretation and misuse of this tool for the purpose of limiting therapist autonomy and patient care. This means we need to be aware of limitations not only relevant to the individual rules but also inherent in the research process involved in deriving and validating these rules.

Clinical Prediction Rules: A Physical Therapy Reference Manual provides ready access to the clinical prediction rules relevant to orthopaedic clinical practice. It starts with a discussion of rules used for screening patients for the need for referral followed by a presentation of rules organized by body region and further divided into diagnostic, prognostic, and interventional rules. Taking into account the dire consequences of incorrect decisions during the screening portion of the examination, only screening rules that have undergone broad-based validation are included. An in-depth but accessible discussion of the research process, common methodological shortcomings in clinical prediction rule research, and relevant statistics provide the clinician with the tools required for critical analysis and appropriate application. Methodological quality scores are provided for prognostic and prescriptive rules and for validation studies. In the absence of a validated methodological quality assessment tool for diagnostic studies, the authors have proposed and provided a quality checklist for such studies. This allows for further critical interpretation by the clinician interested in application of the rules in clinical practice. Current,

evidence-informed, and patient-centered clinical practice in orthopaedic physical therapy and other conservative musculoskeletal care professions requires the clinician to provide care based on an integration of current best research evidence, clinician expertise, and patient preferences. This text provides not only the current best evidence but also adds to clinician expertise by providing the tools required for critical analysis of this evidence. Finally, by providing the clinician with the knowledge required to educate the patient with regard to appropriate interpretation of clinical prediction rules, it also allows for truly informed patient input in the clinical decision-making process.

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