

Editorial

Medical Literature Ahead: Proceed With Caution

“Based on past experience, it is likely that half of what we today believe to be correct arthroscopic knowledge or treatment is wrong. The problem is. . . I don’t know which half.”

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We won’t go so far as to say don’t believe what you read, but we do issue a warning: proceed with caution.

As we have said before, clinically relevant articles of high levels of evidence are required to change surgical practice, and a single publication must be interpreted in the context of the complete body of medical literature.¹ The conclusion of a scientific article depends on the results, the results are determined by the methods, and the methods must address the purpose of a study. (We work backward from the conclusion to remind readers of the logical simplicity of the scientific method that forms the framework of our complex research endeavors.) Thus, when scientific reports reach contradictory conclusions, it does not follow that one of the articles is wrong. Rather, it may be that the studies used different methods that led to different results. In such a case, additional research may ultimately clarify our understanding.

In this context, we introduce the meta-analysis of the incidence of anterior cruciate ligament tears as a function of gender, sport, and knee injury reduction regimen by our friend and Editorial Board member, Chadwick C. Prodromos and his colleagues.² Because their meta-analysis was systematically conducted, we were initially puzzled by the findings. In particular, the conclusions regarding skiers contradict those that we published in a previous review.³ We found injury rates nearly double in female alpine skiers whereas Prodromos found no difference. Yet further investigation clarifies. Rossi et al.³ reviewed 98 published reports in preparation for their Current Concepts review of “The Skier’s Knee,” whereas the meta-analytic methods of Prodromos et al.² resulted in the inclusion of only four publications regarding skiers. Finally, two of the four studies included by Prodromos et al. are evaluations of ski area employee Workers’ Compensation data. In fact, when at work, it is hypothesized that ski area employees often ski on terrain or in a manner that diminishes their risk of injury.³ Meta-analytic methods do not adjust for this fact.

This is not to diminish the work of Prodromos and his group, who have recently published, in addition to the cited article, two other meta-analyses of ACL injury.^{4,5} Rather, we mean to elucidate that, as with original research articles, the conclusions reached by meta-analyses depend highly on the methods. Different meta-analytic methods will result in different studies being included or excluded from an investigation. In addition, different statistical methods may result in meta-analyses of the same studies reaching different conclusions.

We choose to emphasize the importance of meta-analytic methods for a variety of reasons. To begin, this is not the first time that the results of a meta-analysis have contradicted previous publications in the Journal.⁵⁻⁷ Second, the level of evidence of a meta-analysis is only as high as that of the articles included. The meta-analysis of Prodromos et al.² in this issue of *Arthroscopy*, for example, represents Level IV evidence as a result of the low levels of evidence of the previously published literature available for review. Third, depending on the methods, meta-analyses may vary widely in quality, and meta-analytic quality may be assessed using an objective scoring system.⁸ Finally, as we have recently predicted,⁹ concomitant with the evidence-based medicine movement, publication of meta-analyses is becoming more frequent. Readers, and we Editors, must carefully scrutinize the methods when we consider the conclusions of a meta-analysis or a systematic review.

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