Response to the Letter Entitled "The Rotator Cuff Repair Mess" by Dr. Palomo

To the Editor:

Approximately 2,500 years ago in present-day Turkey, an Ancient Greek Ionian wrote the following: "διαιτήμασί τε χρήσομαι ἐπ' ὠφελείῃ καμνόντων κατὰ δύναμιν καὶ κρίσιν ἐμήν, ἐπὶ δηλήσει δὲ καὶ ἀδικίῃ εἴρξειν." Direct translation of this passage to modern English was provided by von Staden[1]: "…And I will use regimens for the benefit of the ill in accordance with my ability and my judgment, but from [what is] to their harm or injustice I will keep [them]."

For human beings, learning begins when a specific action or experience is coupled with a specific result—a process that requires repetition, high-level cognition, and complex neural processing. However, despite our advanced ability to make these associations, it is not possible to predict the result of a specific action in the absence of a previously learned behavior or series of behaviors. It is the accumulation and integration of cogently linked cause-and-effect relations throughout life that allow us to hypothesize the outcome of some future action. The primary function of published research on any topic is to enhance our knowledge by providing documentation that a specific action produced a specific result within a defined set of circumstances. In medical research, we aim to determine which actions produce the most desirable results following the guidance of the Hippocratic Oath. Research in orthopaedic surgery is not an exception.

Research in rotator cuff surgery is not an exception either. Clearly, the past few decades of research has produced volumes of new basic science, biomechanical, and clinical data related to rotator cuff surgery. How do we make sense of all this "mess"? Perhaps it is necessary to take a step back, take a deep breath, and see the big picture.

Dr. Palomo has voiced his frustration regarding the evolution of arthroscopic rotator cuff repair techniques to the readers of *Arthroscopy*.[2] His statements imply that the fluctuant path toward the current state of knowledge in arthroscopic rotator cuff surgery may be the result of motives that involve something other than the improvement of patient care. He states that certain repair techniques may have been developed to simply "fight" the findings of other researchers.

In response to these statements, we challenge the readers to critically evaluate the historical timeline of each rotator cuff repair technique in terms of basic science, biomechanical, and clinical evidence. We suspect that, depending on the pathology involved, (1) the hypotheses of each study have aligned with the state of knowledge at the time of publication, (2) most basic science evidence tends to favor one technique over another, (3) most biomechanical evidence tends to favor one technique over another, and (4) most clinical evidence is equivocal. This may be because of an inability of validated outcomes measures to detect small differences in pain and/or function, the presence of underpowered clinical studies, or a true lack of difference between the different repair techniques, among many other possibilities. As a result, there are numerous "preferred" and "novel" techniques described in the literature that may or may not produce superior clinical results. However, it should be remembered that it is not the responsibility of the individual researcher or group of researchers to dictate which technique should be used for each patient. Rather, it is the surgeon's responsibility to determine the treatment method that is most likely to result in a favorable outcome according to current published evidence, the clinical situation at hand, and the surgeon's technical skill.

Dr. Palomo has also challenged us to improve the direction of our research in the realm of rotator cuff surgery, stating that perhaps we are moving in too many directions at an increasingly rapid pace. However, we argue that research in rotator cuff surgery is moving forward toward a common goal—that is, to provide patients with the best surgical options possible to decrease pain and improve function. Patients want to get better, to get better faster, and to get back to their desired activities without restrictions. Extensive biomechanical research, clinical research, and new technologic advances have helped us achieve this goal of improving treatment outcomes in patients with rotator cuff pathology. There is no question that we have witnessed progressive improvements in postoperative recovery times, retear rates,[3,4] complication rates,[5-7] patient satisfaction,[8-11] and clinical outcomes scores[3,8-11] since the advent of arthroscopic rotator cuff surgery. We have also demonstrated our improved knowledge in the areas of anatomy,[12-14] pathoanatomy,[12] tendon biology,[15-17] surgical techniques,[18-22] repair biomechanics,[23-26] and rehabilitation[27,28] through countless evidence-based studies. The evolution of surgical techniques and medical device technology is rapid and is driven by surgeons

seeking simpler, safer, and more reproducible techniques. Innovative companies simply respond to that need. Where would arthroscopic procedures be today without innovation? Rapid design and manufacturing will facilitate even faster change in the future. Technology helps surgeons perform more precise, more reproducible, and less invasive outpatient procedures that improve patient safety and outcomes while also reducing healthcare costs. Furthermore, there is little doubt that surgeons, organizations, and companies who can keep up with technological innovation will continue to do so. All in all, we are charged with improving the quality of patient care, and as surgeons who strive to improve the quality of life of our patients, we should never be satisfied with the status quo.

Peter J. Millett, M.D., M.Sc.
Ryan J. Warth, M.D.
Vail, Colorado

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Thromboprophylaxis in Arthroscopic Surgery

To the Editor:

I read with interest the meta-analysis by Sun et al.,[1] and I would like to compliment the authors for a thorough review. It shows that thromboprophylaxis is important even for ambulatory care surgeries such as knee arthroscopy, and one should be vigilant in suspecting DVT.

From the article,[1] it is not clear whether there are differences in the incidence of DVT when the aforementioned operation is performed in an ambulatory versus inpatient setting. I would appreciate the authors' thoughts on this.

In addition, Sun et al.[1] mentioned that one of the limitations of the study was the exclusion of studies in which DVT was not screened for by radiographic means, which could lead to under-reporting. My group published a Level II study in which clinical screening was performed but no Doppler studies were performed, and the incidence was 0%.[2] One has to bear in mind the financial implications of the investigations when clinical suspicion is low. I would appreciate the authors' thoughts on this, as well.

Ashish Anand, M.D.
Alexandria, Louisiana

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Authors' Reply

We appreciate the opportunity to address the concerns raised by Dr. Anand about our recent publication. Regarding the ambulatory versus inpatient setting of the studies included in our meta-analysis, there were not enough included to make a proper comparison. Outpatients with arthroscopic surgery, as compared with inpatients, tend to undergo simpler surgical procedures that allow discharge on the surgical day. The procedure bias itself could affect the aforementioned comparison. With studies constantly emerging, this issue will be better addressed within studies with the same arthroscopic procedure.

In our meta-analysis, we included only studies in which there was radiologic screening for DVT. The reported DVT incidence after knee arthroscopy without anticoagulant drugs ranges from 1.5% to 41.2% in the literature, which means that the incidence data could vary wildly from center to center. Moreover, silent DVT, which could also lead to secondary PE, could easily be missed without screening. We do bear in mind the financial implications of the investigations, yet we have to obtain a definitive diagnosis considering DVT because it might develop into fatal PE.

Ye Sun, M.D.
Qing Jiang, M.D.
Nanjing, China

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