

What's Usable and What's Missing in Evidence-Based Medicine for Fracture Management

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A true breakthrough in any discipline is, of course, a rare event, and usually the preserve of mavericks and geniuses. The more mundane truth is that researchers diligently work to add just a little more to the body of knowledge already accumulated over the years. Improvements are made in baby steps rather than giant leaps.



“It is important to find validation of evidence before we incorporate it into our decision-making process.”

Evidence can change practice for the better. We now know that the widespread use of traction for most of the 20th century actually inhibited, rather than promoted, function throughout the healing period. Thankfully, a group of young men met in Biel in Switzerland in 1958 and founded the AO, a working group to investigate the issue of osteosynthesis. It was their systematic approach to gathering evidence in order to show the advantages of internal fixation that provided a major sea of change in the field of orthopedics.

Today, it is just as essential for us to employ a systematic approach given the complexity of our field. As Atul Gawande, MD noted at this

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year's Harvard Medical School, Boston, Massachusetts, commencement address, we have more than 4,000 medical and surgical procedures available to us. He also noted that half of all major surgical complications are avoidable with existing knowledge.¹ But what knowledge is available to us and how good is it?

Using evidence in orthopedics is bedeviled by certain problems—such as the sheer volume of “evidence” out there and the problems of study design. This abundance of “evidence” is certainly a problem for surgeons who do not have the luxury of being full-time academic researchers. With approximately 4,000 clinical studies on fracture care being conducted annually, this is an ever-more pressing conundrum—how can surgeons wade through the vast amount of literature to find the evidence they need to improve patient care?

How usable is all this evidence anyway? When we look at the level of evidence that articles on fractures yield, we find that just 1% are meta-analyses, and a mere 5% are randomized controlled trials (RCTs). In other words, the vast majority of the literature on fractures (94%) does not yield evidence of the highest grade.

To a certain extent, the low grade of evidence found in the literature is attributable to the nature of clinical studies in orthopedics. For example, there are difficulties in having a relevant comparison group and a real difficulty is blinding in surgery. While double blinding is an industry standard for many pharmaceutical trials, in orthopedics it is impossible—surgeons quite simply have to know what treatment they are performing.

It is also important to find validation of evidence before we incorporate it into our decision-making process. For a long time, anecdotal evidence and uncontrolled cohort studies suggested a benefit to arthroscopic lavage for patients with arthritis. However, when Moseley and colleagues conducted an

RCT in 2002 using sham arthroscopic surgery,² they found “the outcomes after arthroscopic lavage/debridement were no better than placebo surgery.” Nevertheless, about 200,000 Americans annually receive arthroscopy for early arthritis in what has blossomed into a \$1 billion industry!

Despite these limitations, evidence-based medicine in orthopedics continues to advance. Not all research has to be an RCT in order to give us the answer we require; cohort studies are often an adequate (and cheaper) solution. Patient and independent outcomes assessors can be blinded, a good example of how we can be creative in adapting standard research

principles to suit the peculiarities of orthopedics. As awareness and practice of evidence-based medicine continues to grow among our peers, better evidence and tools will come to be at our disposal as the field expands and develops.

The last word goes to a man who knew the benefit of clinical research, Maurice E. Müller, AO cofounder and the International Society of Orthopaedic Surgery and Traumatology (SICOT) surgeon of the 20th century. Reflecting upon the AO’s origins he noted, “Our effort to document our patient case studies was the start for evidence-based medicine.” The road to improvement is long, but the work we carry out in orthopedic clinical

research are the baby steps we add to the giant leap he and others made over half a century ago.

AUTHOR’S DISCLOSURE STATEMENT

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