



Editorial

Editorial: Getting Evidence Into Practice – or Not: The Case of Viscosupplementation

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Not news in 2012: “Viscosupplementation Largely Ineffective” [26].

News in 2015 and beyond: “Viscosupplementation Market Value to Exceed \$2.6 Billion by 2021, says GlobalData” [5].

We should be able to say three things about any treatment we use: It is effective, it is safe, and it is worth the cost. Unfortunately, we cannot always achieve this standard in orthopaedic surgery, just as elsewhere in medicine. Some conditions surgeons treat are too

rare for us to accumulate solid data about how they behave, and some procedures too-uncommonly indicated for us to gather high-quality evidence about their efficacies. In addition, some interventions used by surgeons looked promising early on, but later fell from favor as better research found them to be less-effective than initially imagined, or even unsafe. Thermal capsulorrhaphy [12], certain arthroplasty bearing-surface “improvements” old [23] and new [10], and use of bone morphogenetic protein in certain spinal fusions [6] all come to mind here.

Surgeons who follow the evidence should relegate injectable viscosupplements (hyaluronic acid products) to the list of abandoned treatments. Several comprehensive analyses agree that they either are minimally effective or ineffective [9, 14, 20]. They probably are safe, though their use carries some risk [20]. To the degree that they are not effective [9, 14, 20], it is hard to make a case for their value [21].

Yet despite going only one for three on the efficacy-safety-value scorecard, the market for injectable viscosupplements continues to grow [3, 5].

I know there are many proponents of these treatments in the orthopaedic community; however, the observations

about viscosupplementation’s inefficacy are not mine alone. Well-done reviews and meta-analyses recommending against the use of this treatment have appeared in *The New England Journal of Medicine* [7] and *Annals of Internal Medicine* [20]; The Osteoarthritis Research Society International’s (OARSI) guidelines for the non-surgical management of knee osteoarthritis listed viscosupplementation among the treatments of “uncertain appropriateness,” alongside avocado soybean unsaponifiables, chondroitin, diacerein, glucosamine, rosehip, transcutaneous electrical nerve stimulation, and ultrasound [14]. The American Academy of Orthopaedic Surgeons released a clinical practice guideline in 2013 based on an analysis of the best-available research, which concluded, “We cannot recommend using hyaluronic acid for patients with symptomatic osteoarthritis of the knee” [9]. The Academy rated that recommendation as “strong,” meaning it was based on high-quality supporting evidence; that rating carries the following implication: “Practitioners should follow a **Strong** [emphasis theirs] recommendation unless a clear and compelling rationale for an alternative approach is present.”

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The recent projection about viscosupplementation's financial growth [5] came out some 2 years after that practice guideline. No compelling rationale has emerged during that time to justify the use of these products, let alone the increased use of them. Thoughtful critiques and one major new analysis have indeed been published since then [1, 2, 13], but these cannot escape the reality of the primary-source data upon which the Academy's guideline (as well as OARSI's) rest: If viscosupplementation offers any benefit to patients, it is small and of questionable clinical importance. In addition, Jacobs et al. [8] have identified factual and analytical errors in both of those Level V critiques [1, 13] of the Academy's guideline.

Viscosupplementation is not the only treatment surgeons continue to use despite substantial evidence of inefficacy or risk. In fact, more money probably is spent on arthroscopy for degenerative meniscus tears [22], and substantial geographic differences in the frequency of spinal procedures strongly suggests that they are over-used, exposing more patients to surgical risk than may be justifiable [4]. But if there is another example of a musculoskeletal intervention performed principally by orthopaedic surgeons [21] that boasts a growing market despite high-quality reviews,

dozens of randomized trials, methodologically sound meta-analyses, and a robust clinical practice guideline from the Academy recommending against its use, I am not aware of it.

Why might this be so? One reason might be that surgeons have relatively few effective nonsurgical alternatives that help patients with their joint pain, and—being members of a helping profession—we find this frustrating. However, our lack of effective nonsurgical treatments cannot justify the use of an ineffective one, and it must not be used to justify surgery unless surgery is indicated. Some patients will have pain that persists despite well-tested nonsurgical treatments, but not enough to warrant major joint surgery; others may not fit the biopsychosocial profile that supports a decision to perform elective arthroplasty. The answer to this is not to use a treatment like viscosupplementation that studies suggest is ineffective, nor to take a chance on surgery when it seems ill-considered to do so, but rather to explain to patients that there are some problems for which we have no effective treatments, and to help those patients adjust and adapt.

Another reason that viscosupplementation remains in common use is a common perception that it works. There may be many explanations for this perception, but it seems most likely to be the result of transfer

bias—the satisfied patients return, and the dissatisfied ones move on to get further care elsewhere, leaving the surgeon feeling more effective than (s)he should. Selection bias and assessment bias (failing to use validated outcomes tools)—both of which are present in day-to-day practice experience—also tend to inflate the apparent benefits of the treatments we use. The earlier-noted reviews, meta-analyses, and practice guidelines evaluated high-quality randomized trials went to lengths to minimize these three sources of bias, and when they did so, the apparent benefits of the treatment were found to be much smaller (or were absent entirely), compared to earlier and less-robust analyses. There are many treatments for arthritis that some providers' experiences and anecdotal evidence might support—copper bracelets, magnets, and others—but most physicians would not accept anecdotes or experiences as justification to use such treatments when evidence has found them to be ineffective [18, 19]. If the evidence against viscosupplementation's efficacy is robust, as appears to be the case, should we not likewise abandon this treatment, regardless of anecdotes and experiences?

But the growing market for these products suggest that the opposite is happening, and this raises many questions about evidence, practice, and

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perhaps even the role of journals in this process. We know that evidence diffuses into practice both slowly and inconsistently [11, 25]; could the observations about increased viscosupplementation usage therefore simply represent the usual delay between discovery and implementation of evidence into clinical care? After all, the guidelines recommending against viscosupplementation are not the only ones that have yet to make the leap from paper to practice [16], and as professionals, surgeons have a reasonable aversion to “cookbook” medicine [24]. In the case of viscosupplements, though, the evidence seems too robust to ignore. We know that marketing, both to physicians and to patients, influences practice [15, 17]. Is the case of viscosupplementation simply another instance of advertising out-muscling science? One hopes that the ongoing use—and seemingly increasing market size—of viscosupplements is not a function of self-interest on the part of the physicians using these products, although their use remains remunerative to physicians and practices. Are journals failing to get the right evidence in front of the right providers in ways they can use it? If so, how might we do better?

Share your thoughts with us about how evidence influences practice—or fails to do so—in a letter to the editor to eic@clinorthop.org.

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