

# Intra-articular Hyaluronic Acid for Knee Osteoarthritis: Utilization Trends Amid Conflicting Clinical Practice Guidelines

Chris J. Lee<sup>1</sup>, Albert H. Lee<sup>1</sup>, Wesley Day<sup>1</sup>, Jonathan N. Grauer<sup>1</sup>

<sup>1</sup>Yale School of Medicine, Department of Orthopaedics & Rehabilitation, New Haven, CT  
chris.j.lee@yale.edu

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**INTRODUCTION:** Evidence has been mixed about the efficacy of intra-articular hyaluronic acid (HA) for knee osteoarthritis. This has led to conflicting clinical practice guidelines (CPGs) over the years. After the American Academy of Orthopaedic Surgeons (AAOS) issued a strong recommendation against HA in 2013, a claims-based study showed rapid decline in use. More recent endorsements from Osteoarthritis Research Society International (OARSI) in 2019 and the Veterans Affairs and Department of Defense (VA-DoD) in 2020 may have altered this trajectory. The current study aimed to gauge contemporary utilization of HA knee injections.

**METHODS:** All patients aged 18 years and older diagnosed with knee osteoarthritis were identified from the 2010Q1 – 2023Q1 PearlDiver database. The percentage of patients receiving intra-articular HA relative to the number of patients diagnosed for knee osteoarthritis was calculated quarterly. Linear regression analyses were segmented by two key CPG inflection points: 2013Q3 AAOS’ recommendation against HA injections and the 2019Q4 endorsements. Analyses were also stratified by provider specialty. Statistical significance was set at  $P < 0.05$ .

**RESULTS SECTION:** A total of 16,581,526 knee OA patients (10,427,135 female and 6,154,391 male) were identified, among which HA knee injections were performed for 1,886,788 (11.4%). For the post-2013 AAOS CPG period (2013Q3–2019Q3), injection rates decreased ( $-0.10\%$  per quarter;  $p < 0.001$ ). However, following OARSI/VA-DoD endorsement (2019Q4–2023Q1) the slope leveled to  $-0.003\%$  per quarter;  $p = 0.921$  (Figure 1). Through the study period, utilization declined for both females and males, and both younger and older patients ( $< 50$  years old and  $\geq 50$  years old) ( $p < 0.001$  for all). Utilization declined among orthopaedic surgeons, non-operative musculoskeletal specialists, and primary care physicians, while utilization increased among pain medicine physicians ( $p < 0.001$  for all).

**DISCUSSION:** This study confirms that the initial decline in HA utilization following the 2013 AAOS CPG has plateaued after more recent conditional endorsements from OARSI/VA-DoD. Notably, practice patterns diverged across specialties, with utilization increasing among pain medicine physicians while declining in other groups. Limitations include the use of administrative claims data, which lacks patient-level clinical details such as disease severity and patient-reported outcomes, and may involve coding inaccuracies. Furthermore, changes in utilization may reflect factors beyond physician attitudes, such as insurance coverage or patient preference. In conclusion, while CPGs can influence practice, conflicting recommendations and divergent trends across specialties may lead to stabilization rather than sustained change.

**SIGNIFICANCE/CLINICAL RELEVANCE:** This study provides contemporary, nationwide evidence on how conflicting clinical practice guidelines are associated with utilization trends of a common osteoarthritis treatment. Understanding these patterns is crucial for clinicians, policymakers, and researchers navigating evolving evidence and recommendations for non-operative knee OA management.

FIGURE 1:

## Trends in utilization of hyaluronic-acid injections for knee osteoarthritis

