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ORTHOPAEDIC HEALTH POLICY (A MILLER, SECTION EDITOR)

Medicare reimbursement and orthopedic surgery: past, present, and future

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Abstract
Purpose of review This paper reviews the history and structure of Medicare reimbursement with a focus on aspects relevant to the field of orthopedic surgery. Namely, this includes Parts A and B, with particular attention paid to the origins of Diagnosis Related Groups (DRG) and the physician fee schedule, respectively. We then review newer policies affecting orthopedic surgeons.
Recent findings Recent Medicare reforms relevant to our field include readmission penalties, the evolution of bundled payments including the mandatory Comprehensive Care for Joint Replacement (CJR) and Surgical Hip and Femur Fracture Treatment (SHFFT) programs, and the new mandatory Merit-based Incentive Payment System (MIPS) pay-for-performance program.
Summary Providers are facing an increasingly complex payment system and are required to assume growing levels of financial risk. Physicians and practices who prepare for these changes will likely fare best and may even benefit.

Keywords Medicare · Orthopedic surgery · Reimbursement · Healthcare reform · Bundled payments · Merit-based incentive payment system (MIPS)

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Abbreviations

ACE	Acute Care Episode (Bundled Payment Program)
ACA	Patient Protection and Affordable Care Act of 2010
ACI	Advancing Care Information
ACO	Accountable Care Organization
APMs	Alternative Payment Models
BBA	Balanced Budget Act of 1997
BPCI	Bundled Payment for Care Improvement (Bundled Payment Program)
CC	Complications and Comorbidities
CEHRT	Certified Electronic Health Record Technology
CHIP	Children's Health Insurance Program
CJR	Comprehensive Care for Joint Replacement (Bundled Payment Program)
CMMI	Center for Medicare and Medicaid Innovation
CMS	Centers for Medicare and Medicaid Services
COLA	Cost-of-living adjustment
CPS	Composite Performance Score (for MIPS)
CPT	Current Procedural Terminology
DRG	Diagnostic Related Group
DSH	Disproportionate Share Hospitals
EHR	Electronic Health Record
FFS	Fee for Service
HAC	Hospital Acquired Conditions
HCAHPS	Hospital Consumer Assessment of Healthcare Providers and Systems
HMO	Health Management Organizations
HRRP	Hospital Readmission Reduction Program
ICD-10	International Classification of Diseases, 10th Revision
IPAB	Independent Payment Advisory Board
IPPS	Inpatient Prospective Payment System

LEJR	Lower Extremity Joint Replacement
MACRA	Medicare Access and CHIP Reauthorization Act of 2015
MCC	Major Complications and Comorbidities
MedPAC	Medicare Payment Advisory Committee
MEI	Medicare Economic Index
MMA	Medicare Prescription Drug, Improvement, and Modernization Act of 2003
MIPS	Merit-based Incentive Payment System
MSA	Metropolitan Statistical Area
MS-DRG	Medicare Severity-Diagnostic Related Group
MU	Meaningful Use
P4P	Pay for Performance
PQRS	Physician Quality Reporting System
PRO	Patient-Reported Outcomes
QPP	Quality Payment Program
RBRVS	Resource-based Relative Value Scale
RVU	Relative Value Unit
SGR	Sustainable Growth Rate
SHFFT	Surgical Hip and Femur Fracture Treatment (Bundled Payment Program)
VBM	Value Based Modifier

Medicare history

Original Medicare

Medicare was established in 1965 to provide healthcare for citizens age 65 and over. "Original Medicare" encompassed two branches: Part A provided insurance for hospital payments, and Part B provided insurance for payments to physicians and other providers [1].

Original Medicare was a pure "Fee for Service" (FFS) system, and the covered services and conditions were subsequently expanded several times. For example, in 1972, Part B was expanded to cover certain nonphysician providers, including physical therapists and chiropractors. That same year, the list of eligible beneficiaries was expanded beyond the elderly to cover patients with end-stage renal disease (ESRD) and the disabled [1].

Since its inception, Medicare's spending has increased dramatically, primarily not only due to rising healthcare costs but also as a result of the rapidly growing elderly population [2]; the average US lifespan has risen from 70.8 to 78.8 years over the past five decades, while the age of eligibility has remained 65 [3]. The history of Medicare is best understood by examining the four parts of the system (A through D).

Part A (hospital reimbursement): prospective payment and diagnosis related groups

After 18 years of FFS payments, Medicare introduced Diagnosis Related Groups (DRG) in 1983, arguably representing the most significant change in the history of the program [4]. DRG are the core component of the Medicare Inpatient Prospective Payment System (IPPS) which aimed to reduce Medicare hospital payments [5•]. DRG treat hospitalizations as a specific "product" with a predetermined price, incentivizing hospitals to avoid extraneous services that would previously have been profitable under the FFS system.

IPPS immediately lowered Medicare spending by reducing the average hospital length of stay [6–10]. The DRG system was subsequently adopted by many states' Medicaid programs and private insurance companies hoping to reap similar benefits [11, 12]. Some of these savings to government programs, however, have come at the expense of private insurance companies. Medicare and Medicaid reimburse at relatively low levels, often failing to completely cover inpatient hospital costs. As a result, hospitals rely on higher payments from private insurance companies to internally subsidize their Medicare and Medicaid patient populations [13].

The current DRG system has expanded to over 750 treatment codes [14]. The list is updated annually with occasional major revisions. The most notable change was a shift from "CMS-DRG" to "Medicare Severity-DRG" (MS-DRG) in 2007 to make payments more accurately match hospital costs [15]. Then, in 2008, certain diagnoses were labeled as hospital-acquired conditions and henceforth not reimbursed [16].

While DRG payments are predetermined based on a given diagnosis, they can differ widely between hospitals; CMS adjusts payments based on several factors including local labor and cost indices. Teaching hospitals and "Disproportionate Share Hospitals" (treating higher volumes of low-income patients) get higher rates, and CMS also makes outlier payments for extremely expensive cases [5, 17].

Payments may also be adjusted upward for patient complexity. Hospitals can submit up to 25 secondary diagnoses for each admission, and certain complications and comorbidities (CC) or major CC (MCC) trigger higher payments [14, 17]. CC typically include nonacute issues such as chronic respiratory failure or gastric ulcers without perforation or hemorrhage, whereas MCC typically involve acute problems such as acute respiratory failure or a bleeding or perforated ulcer. Under ICD-10 (International Classification of Diseases, 10th Revision) coding, there are over 14,000 CC and 3200 MCC [14]. This three-tiered classification is particularly important from an orthopedic perspective as CMS plans to use this methodology to risk-adjust payments for bundled payment programs, including joint replacements [18••, 19] and hip fractures [20•, 21].

Part B (physician reimbursement): the physician fee schedule and sustainable growth rate

Unlike hospital payments, Part B reimbursement has remained in a FFS structure since its inception. Initially,

physicians were paid solely based on their charges, and spending grew rapidly. In 1975, CMS introduced the Medicare Economic Index (MEI), a measure meant to predict how much the costs of practicing physicians grow annually so that spending increases could be limited to this amount [22]. The MEI by itself failed to limit spending; Congress passed annual laws from 1984 to 1991 restricting Medicare physician payments more stringently than the MEI. At that time, there were also large unwarranted variations in payments between physicians [23]. The fee schedule we know today was established in 1989 and enacted in 1992 to reduce both overall spending and variation across practitioners [23].

This fee schedule employs the Resource-Based Relative Value Scale which assigns Relative Value Units (RVUs) for three categories for each service: physician effort (52%), practice expenses (44%), and malpractice insurance (4%). These RVUs are adjusted using geographical cost indices to determine reimbursement [23]. The MEI remains in use to determine the "Conversion factor" for translating RVU into dollars. The fee schedule now defines RVU amounts for more than 7000 Current Procedural Terminology (CPT) codes [24].

The spending restrictions enacted along with the Fee Schedule in 1992 successfully limited Part B growth to 1–2% per year [25], but the federal government aimed to further reduce this figure by establishing the Sustainable Growth Rate (SGR) as a core component of the 1997 Balanced Budget Act (BBA) [26]. This policy limited Part B payment increases to the rate of GDP growth (i.e., the country's ability to pay) [26].

The SGR was unremarkable for 4 years until Medicare Part B payments were cut by 4.8% in 2002 [25]. There was uproar among physicians, and Congress passed the "Doc Fix" law that delayed the SGR-mandated pay cuts 1 year. Over the next decade, variations of "Doc Fix" were passed at least annually, often dramatically at the last minute. The SGR was ultimately repealed in 2015 as part of the Medicare Access and Children's Health Insurance Program (CHIP) Reauthorization Act (MACRA), also known as "Permanent Doc Fix," which will fundamentally change the way Medicare pays physicians [27••] (see below for further discussion of MACRA.)

Part C: Medicare advantage plans

The Balanced Budget Act (BBA) of 1997 created Part C or "Medicare + Choice" plans in an effort to further curb spending [28, 29]. This law allowed Medicare beneficiaries to enroll in commercial health insurance plans, typically through health management organizations (HMO). HMO offer patients relatively little choice among providers on a capitated basis (i.e., Medicare pays the commercial insurer a predetermined monthly sum) [30]. At a minimum, these plans must cover the benefits offered by Parts A and B [31].

Part C plans came to be known by their current title, "Medicare Advantage," under the 2003 Medicare Prescription Drug, Improvement, and Modernization Act (MMA) [28]. This act also allowed insurers to impose several new restrictions on plans such as formularies, geographical boundaries, and restricted provider networks [32]. Still, enrollment has grown steadily, even despite recent cuts in capitated payments to commercial insurers [33]. Thirty-one percent of Medicare beneficiaries are currently enrolled in Part C [33].

Part D: Drug coverage and the "donut hole"

The 2003 MMA also established Part D to provide optional coverage for prescription drugs beginning in 2006 [1]. Membership in Part D has consistently grown, with 72% of Medicare patients currently enrolled [34]. This plan has received public attention for the "donut hole," a gap in coverage in which drugs are not completely covered: When an individual has spent more on prescription drugs than the plan's monthly limit ($3700 in 2017), he or she begins paying out-of-pocket for drugs until qualifying for "catastrophic" coverage ($4950 out-of-pocket spending in 2017) [35]. Research suggests important clinical implications: nearly 20% of Medicare patients who use Part D reached the donut hole in 2009, and they commonly became noncompliant with medications as a result [36]. CMS has gradually been "closing the donut hole": In 2017, patients will be responsible for only 40% of these costs. However, credit for 95% of the cost (not just the 40% actually paid by the patient) will be counted as "out-of-pocket" spending to help patients reach the threshold for catastrophic coverage more easily [35]. The Affordable Care Act (ACA) entails plans to eliminate the donut hole by 2020 [37].

Medigap

In 1980, CMS began allowing commercial insurance companies to offer Medigap plans which cover co-payments for Parts A & B (Medigap is not relevant to patients with Part C plans or prescription drug purchases as these are covered by Part D) [38, 39]. Currently, 23% of Medicare patients have Medigap plans [40]. CMS allows ten options (Plans A-N), and C and F are the most common, accounting for 53% of Medigap plans [40]. These are known as "Cadillac plans" because they provide "First-dollar coverage," meaning the patient faces no copays [41]. Economists have decried these plans due to "moral hazard" (i.e., patients have no financial incentive to minimize care) [42]. The ACA includes stipulations that will make these plans illegal by 2020 in an effort to reduce spending [41, 43].

Recent reforms

Patient protection and Affordable Care Act

The 2010 ACA or "Obamacare" has several well-known components including insurance mandates for all individuals and businesses with 50 or more employees, a guarantee that insurance companies cannot exclude patients for pre-existing conditions, new insurance exchanges and associated subsidies for low-income citizens, Medicaid expansions, and gradual closure of the Part D donut hole [44].

However, the ACA also contains several provisions that directly affect Medicare payments for orthopedic surgery, such as creation of the Independent Payment Advisory Board (IPAB) [45•], the Hospital Readmission Reduction Program (HRRP) [46], and the Center for Medicare and Medicaid Innovation (CMMI) [47]. This last program operates numerous Alternative Payment Models (APMs), such as episodic or bundled payments and Accountable Care Organizations (ACO).

IPAB

The IPAB is a 15-member committee created by the ACA to slow the growth of Medicare spending [45•]. Members are appointed by the president and include representatives from different sectors of the healthcare field (physicians, insurers, health economists, etc.); they must leave their prior positions and serve full-time for 6-year terms [45•]. This board is an enhanced version of the Medicare Payment Advisory Committee, which was enacted in 1997 through the BBA to propose spending cuts to Congress [48]. However, the IPAB can implement cuts independently (e.g., cutting physician reimbursement for certain procedures), and Congress would need a supermajority vote to overturn the policy [45•]. The American Academy of Orthopedic Surgeons (AAOS), American Association of Hip and Knee Surgeons, and hundreds of other medical societies have expressed outrage over IPAB's unprecedented power and called for repeal [49]. However, IPAB is only called into action if projected spending exceeds CMS' target (which is based on consumer price indices), and this has not yet happened [50]. As a result, the IPAB has not been convened, and no members have been appointed.

HRRP and readmission penalties

In 2013, CMS introduced financial readmission penalties under the authority of the ACA for three conditions: myocardial infarction, heart failure, and pneumonia [51••]. Penalties covered a 30-day post-discharge period and were applied to hospitals with "excess readmissions" (i.e., more than would be expected after risk-adjustment). The maximum penalty was 1% of the hospital's total Part A Medicare claims for the year and rose by 1% annually until reaching 3% in 2015, where it is capped. The initial program was criticized for inadvertently penalizing planned readmissions, but a 2014 modification of the policy addressed this issue [51••]. Studies demonstrated early success, with Medicare readmission rates falling upon announcement of the project [52]. Penalties for total joint arthroplasty (TJA) and chronic obstructive pulmonary disease were added in 2015 [51••]. This is unsurprising, as TJA comprises the largest single financial outlay for Medicare (5.7% of total expenditures) [53]. Subsequently, CMS has continued to expand the penalty program annually [51••], so it is likely that there will be more orthopedic penalties in the future.

Previously, post-arthroplasty readmissions had been financially beneficial under Medicare reimbursement, but research suggests that penalties now far outweigh any financial benefit [54]. Hospitals should therefore be willing to invest in initiatives to maintain below-average readmission rates. Of note, TJA penalties are only relevant for providers who are not participating in arthroplasty bundled payment programs. However, those programs also create strong financial incentives to avoid readmissions.

CMMI and bundled payments

Medicare has been experimenting with bundled payments for nearly 10 years. These programs involve bundling services that were previously billed separately and, more importantly, bundling payments for all providers involved, including hospitals, physicians, and others. Orthopedic surgery, and especially arthroplasty, became an early target for bundled payments given the high Medicare expenditures in this field and the relatively predictable course of the episode of care.

Medicare launched the Acute Care Episode (ACE) demonstration project in 2008, which allowed voluntary participation and focused on orthopedic and cardiac procedures. The bundles included only acute inpatient management without post-discharge care [55]. Five hospitals were selected to participate and demonstrated reduced costs by $330–$1430 per orthopedic episode without sacrificing quality [56]. Following this success, CMS launched the Bundled Payment for Care Improvement (BPCI) Initiative in 2013 under the CMMI. This was a voluntary 3-year program (recently extended to 5 years) with four models, each offering different rules [57•]. For example, timeframes for different models included isolated hospitalizations, post-discharge care for 30–90 days, or both. BPCI models may include all providers or only the hospital and may be determined retrospectively or prospectively [57•].

Based on the success of BPCI, in 2015, CMS announced the Comprehensive Care for Joint Replacement (CJR) program which is mandatory for all lower extremity joint replacements (LEJR) in 67 "metropolitan statistical areas," chosen based on high population density [18••]. The included

procedures are total hip arthroplasty (THA), total knee arthroplasty (TKA), and total ankle arthroplasty (TAA). CJR is based on BPCI Model 2 and therefore includes the surgical hospitalization with 90 days of post-discharge care, incorporates the hospital and all providers, and is calculated retrospectively. Patients are identified by DRG 469 and 470, and the hospital is primarily accountable. A "target price" per patient is set for each hospital based on its historical claims and those of neighboring hospitals (in the future, only regional benchmarks will be used). With each CJR admission, Part A and Part B reimbursements are paid normally. At the end of the year, if the sum of these payments is less than the cumulative target price, the hospital is eligible for a "Reconciliation Payment" equaling the difference. However, hospitals must also report quality metrics in three categories: patient satisfaction measured by Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS), complication rates, and patient-reported outcomes. If the resultant composite score is inadequate, the hospital is ineligible for reconciliation payments. Additionally, if total reimbursement exceeds the cumulative target price, the hospital owes CMS a "Repayment" equaling the difference; however, there is no risk in year 1 (2016) and a stop loss of 5% in year 2 that gradually rises to 20% by year 4 [58].

Of note, hospitals already participating in BPCI models for arthroplasty that include the surgical hospitalization are exempt from CJR [18••]. For CJR hospitals, authors tend to agree that the primary tactics will be reducing post-discharge care (e.g., avoiding discharges to nursing facilities) and using less expensive implants [59, 60]. Importantly, CMS only plans to risk-adjust CJR payments for two scenarios that tend to be relatively expensive: fractures (i.e., nonelective cases) and DRG 469 which usually indicates a major medical complication [18••]. Research suggests that this will not adequately compensate providers for certain complex patient populations [61–63]. AAOS has voiced concerns about inadequate risk adjustment as well as the inclusion of TAA in the bundle. Hopefully, CMS will address these issues in future iterations.

Most recently, CMS has announced a bundling program for Surgical Hip and Femur Fracture Treatment (SHFFT) along with new cardiac bundles to begin in July 2017 [20•]. Patients will be included on the basis of DRG (470–472) and the preliminary rules are similar to CJR [21]. AAOS has again expressed early concerns including lack of risk-adjustment and appropriate outcome measures [64].

MACRA

The 2015 MACRA bill is best known for repealing the SGR, but its effects on the physician fee schedule (i.e., Part B payments) will be much more extensive. Under this law, Medicare physician payments will rise by 0.5% annually until 2019, and Part B will then transition to a scheme known as the Quality Payment Program which will require physicians to participate in one of two tracks [27••, 65••]. The baseline reimbursement for given services will no longer rise annually but will be adjusted upward or downward for each physician based on the rules of their track. Beginning in 2026, average payments will begin to rise again annually but only by 0.25%.

If more than 25% of a doctor's Medicare reimbursement or 20% of their Medicare patients in 2019 are enrolled in an Advanced Alternative Payment Model (APM), they will automatically be enrolled in the APM track and receive a 5% annual bonus [65••]. These thresholds will gradually rise to 75% of a given doctor's Medicare reimbursement or 50% of their Medicare patients by 2023 and then remain at those levels. Advanced APMs are a subset of APM with three requirements. First, payment must be based on quality measures comparable to the second track (discussed below). Second, physicians must bear "more than nominal" risk. Third, participants must use "Certified Electronic Health Record Technology" (CEHRT) [21].

There is consensus that the APM track will be financially and organizationally favorable, so there was initial disappointment among provider organizations when the CJR bundled payment program was not considered an Advanced APM [66, 67]. CMS provided two reasons. First, the CJR program does not carry a CEHRT requirement. Second, participating surgeons have the option to minimize their risk depending on the financial agreement they reach with their hospital [21]. Fortunately, CMS divided CJR into two tracks, where Track 1 allows participants to qualify as Advanced APM by attesting to CEHRT usage and submitting financial agreements (between participating surgeons and hospitals) to CMS, verifying more than nominal risk [21].

Besides arthroplasty specialists practicing in the 67 regions where the CJR and SHFFT programs are mandated, other orthopedic surgeons likely to qualify for the APM track include those practicing in health systems that have enrolled as Medicare ACO and, potentially, those performing a high volume of hip fractures in SHFFT regions. BPCI arthroplasty programs will not qualify as Advanced APM, but CMS has announced plans to develop voluntary bundled payment programs for surgeons outside the CJR regions who wish to meet these criteria [21].

Most physicians will not meet the aforementioned APM thresholds and will therefore be enrolled in the Merit-Based Incentive Payment System (MIPS) track which is a pay-for-performance (P4P) program [68]. This track is much more complex and includes the risk of financial losses; many authors agree that it was intended to be less attractive [69, 70]. MIPS consolidates three existing Medicare P4P programs and creates a fourth [65••]. The previous penalties and rewards for these P4P programs will be discarded, and each physician will face a potential risk or reward totaling 4% of their annual

Medicare reimbursement in 2019. This total will grow to 9% by 2022, where it will remain [68]. Importantly, MIPS is a "zero sum game," meaning that financial rewards for high performers are funded by penalties levied against low performers [25].

Adjusted payments begin in 2019 but will be based on 2017 performance; physicians who do not submit any 2017 data will face a 2019 penalty totaling 4% of their annual Medicare reimbursement [65••]. However, 2017 is considered a transitional year with relatively low reporting thresholds [71]. For example, physicians can avoid penalization by submitting only 90 days of MIPS data (or longer periods that do not fully meet MIPS criteria). Participants who score in the lowest quartile, as judged by the MIPS Composite Performance Score (CPS), will also automatically be assigned the maximum annual penalty. However, since the program is "zero sum," these penalties make more funds available for bonuses. As a result, participants with a CPS above the annual threshold will receive an additional payment adjustment up to a factor of three (e.g., a physician with a top CPS in 2017 can receive up to a 12% bonus in 2019 and a 27% bonus in 2022 and onward) [72]. Moreover, exceptional performers can earn an additional 10% upward adjustment (paid separately by CMS to incentivize high scores rather than being funded by MIPS penalties) [72]. However, these additional bonuses are "unlikely" [73].

The four components of MIPS that make up the CPS are entitled *Quality*, which replaces the preexisting Physician Quality Reporting System, *Cost*, which replaces the Value Based Modifier, *Advancing Care Information* (ACI) which replaces the Meaningful Use (MU) program, and the new *Improvement Activities* category [74]. MIPS scoring for 2017 will be weighted 60% on Quality figures, 25% on ACI, and 15% on Improvement Activities; cost figures will not be incorporated until 2018 to calculate 2020 bonuses and penalties [74].

Quality reporting requires physicians or their practices to choose six measures to report from 271 available options. Twenty-one are listed under "orthopedic surgery," including functional assessments for TKA, THA, and osteoarthritis, as well as simpler measures such as identification of TKA prosthesis type in operative reports, infusion of preoperative antibiotics, and venous thromboembolism prophylaxis. Screening measures are also listed, including preoperative evaluation of BMI, blood pressure, and tobacco use [75]. Cost reporting does not require any specific reporting because it is automatically derived by CMS from Medicare claims.

ACI reporting is based on "Modified Stage II" of MU, but CMS has worked to simplify the metrics and refine the overall focus, for example, emphasizing the most important goals such as interoperability [76]. Participants can earn a score up to 131%, where anything above 100 counts for full credit. A base score up to 50 is awarded based on submission of five required measures: use of e-prescribing, patient access to their electronic health record (EHR), conducting a security review to verify adequate encryption, creating care summaries, and sharing these summaries [77]. Participants can then choose up to eight of ten additional measures and earn up to 10 percentage points for each, depending on its quality [73, 77].

Improvement Activities, also known as the Care Improvement program, the fourth component of MIPS, is meant to focus physicians on certain themes: care coordination, patient engagement, and safety [78]. Again, a relatively low threshold has been set for 2017: physicians must attest that they completed four "Improvement Activities" for at least 90 days (providers in small groups or rural areas are only asked to complete two) [78]. Ninety-two options currently exist and include receiving training on care coordination, promoting patient "self-management," antibiotic stewardship, and using preoperative risk calculators [78]. In the future, more activities will likely be required and will need to span the full year.

Conclusions

Even with the potential repeal of the ACA looming [79], most of the recent reforms affecting orthopedic surgeons are unlikely to change. For instance, MACRA is unlikely to be overturned because it was passed with strong bipartisan support due to universal disdain for the SGR. As a result, MIPS is likely here to stay. Additionally, the CMMI and its initiatives (bundled payments, readmission penalties, etc.) are now closely entangled with Medicare payments and unlikely to disappear.

These changes will require providers to navigate more complex payment systems than ever before. Providers will also be assuming greater levels of financial risk for performance. Practices that not only pay attention to but also master these systems will likely fare best and may even benefit from the changes. Moreover, with increased focus on quality and outcomes reporting, patients may also benefit. Lastly, as a group, orthopedic surgeons will be wise to justify reimbursement by proving the value of their work. The AAOS is already leading this effort by demonstrating the cost-effectiveness of several common orthopedic interventions [80–83].

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Human and animal rights and informed consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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