

Implementing a Pilot Project for Bundle Payment in Patients with Osteoarthritis Undergoing Hip and Knee replacement

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Introduction

Hip and knee osteoarthritis (OA) represents a significant global health challenge, affecting millions of individuals and leading to considerable disability and financial burden on healthcare systems. Traditional healthcare payment models, particularly fee-for-service, exacerbate this challenge by prioritizing the quantity of care over the quality of outcomes achieved. To address this issue, a team of value-based healthcare experts, in collaboration with a prominent orthopedic NGO with leading orthopedists that have introduced an orthopedic patient registry, has developed a bundled payment (BP) model for OA care in Bulgaria that aims to improve patient outcomes and optimize healthcare delivery.



Methods

The BP model encompasses the entire treatment cycle for patients with hip and knee OA undergoing joint arthroplasty, including preoperative care, diagnostic imaging, hospitalization (excluding the cost of prostheses), three-month follow-up, treatment of common complications, and a 14-day rehabilitation period. The model incentivizes integrated care and rigorous outcome measurement through the utilization of an orthopedic registry inaugurated by the orthopedists from the NGO in 2022. The methodology involves (1) Stakeholder Engagement: Initial discussions with stakeholders, including the National Health Insurance Fund, provided a positive outlook for acceptance and implementation.; (2) Risk Stratification to prevent selective bias, including only patients classified as ASA I and ASA II, indicating relatively healthy individuals undergoing elective surgery.; (3) Data Collection and Analysis utilizing the ICHOM standardized set for hip and knee OA treatments that incorporates administrative, clinical, and patient-reported data (PROs). An innovative online messaging tool is employed to streamline data collection and enhance patient engagement.; (4) Identifying the most common complications associated with total knee and hip arthroplasty procedures, respective frequencies based on current data, and defining strategic target percentages. The forthcoming pilot project involves six voluntarily participating hospitals over one year. At the end of this phase, the program will be evaluated based on feedback from medical institutions and an effectiveness analysis to determine improvements in clinical outcomes and patient satisfaction.

Results

The BP model shows significant potential in reducing complications and optimizing resource use. The most common complications included in the bundle price are deep vein thrombosis, periprosthetic infections, and various types of periprosthetic fractures. Since the objective of the pilot phase is to establish an environment conducive to enhancing outcomes, promoting care integration, and encompassing the entirety of the care cycle, some of the target values of complications are intentionally set to be achievable. Key expected results include (1) Operational Efficiency: Streamlined workflows and reduced unnecessary treatments lead to increased overall value for both patients and healthcare providers.; (2) Improved Patient Outcomes: Regular assessment of PROs and clinical outcomes demonstrate enhancements in patient satisfaction and quality of life. The continuous monitoring allows for timely interventions and adjustments in care plans.; (3) Cost Savings: The alignment of financial incentives with patient outcomes minimizes additional costs associated with postoperative complications and inefficient treatment strategies.

Table 1. ASA I and ASA II categories according to the classification of the American Society of Anesthesiologists

SA PS classification	Definition	Examples of such adults include, but are not limited to:
ASA I	A normal healthy patient	Healthy, non-smoker, no or minimal alcohol use
ASA II	Patient suffering from a minor systemic disease	Only minor illnesses with slight functional disabilities. Current smoker, moderate alcohol consumption, pregnant, obese (30<BMI<40), well-controlled DM/EH, mild lung disease

Table 2 Complication rate target for surgically treated OA patients that will be included in the bundled payment program

Complication	Frequency, %	Goal, %
Deep venous thrombosis	14.13 - 20.18 ⁽¹⁻³⁾	18
Periprosthetic infections	0.8 – 1.9 ^(4,5)	1.9
Periprosthetic fracture at primary hip and knee OA	2.5 ⁽⁶⁾	2.5
Periprosthetic fracture in hip arthroplasty with mechanical fixation	5.4 ⁽⁷⁾	5.4
Periprosthetic fracture in hip arthroplasty with cement fixation	0.3 ⁽⁷⁾	0.3
Periprosthetic fracture at revision hip surgery	20.9 ⁽⁷⁾	20.9

References

1. ROLFSON O, WISSIG S, VAN MAASAKKERS L, STOWELL C. Defining an International Standard Set of Outcome Measures for Patients With Hip or Knee Osteoarthritis: Consensus of the International Consortium for Health Outcomes Measurement Hip and Knee Osteoarthritis Working Group. ICHOM. 2016;68:1631-1639.

2. Kawai T, Goto K, Kuroda Y, Matsuda S. : Lower Activity and Function Scores Are Associated with a Higher Risk of Preoperative Deep Venous Thrombosis in Patients Undergoing Total Hip Arthroplasty. J Clin Med. 2020;9(5):1257.

3. Santana D, Emara A, Orr M, et al. An Update on Venous Thromboembolism Rates and Prophylaxis in Hip and Knee Arthroplasty in 2020. Med. 2020;56(9).

4. Wainwright T, Burgess L, Middleton R. A Single-Centre Feasibility Randomised Controlled Trial Comparing the Incidence of Asymptomatic and Symptomatic Deep Vein Thrombosis Between a Neuromuscular Electrostimulation Device and Thromboembolism Deterrent Stockings in Post-Operative Patients Recov. Surg Technol Int. 2020;36:289-298.

5. Kamath A, Ong K, Lau E. Quantifying the burden of revision total joint arthroplasty for periprosthetic infection. J Arthroplast. 2015;1492-1497.

6. Bjerke-Kroll B, Christ A, McLawhorn A. Periprosthetic joint infections treated with two-stage revision over 14 years: an evolving microbiology profile. J Arthroplast. 2014;29:877-882.

7. Konan S. Periprosthetic fractures associated with total knee arthroplasty: an update. Bone Joint J. 2016;1498-96.

8. Berry D. Epidemiology: hip and knee. Orthop Clin North Am. 1999;30:183-190.