Delivering Value-Based Care in Total Knee Arthroplasty: Eight Years of Reduced Healthcare Utilization with Maintained Safety

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INTRODUCTION:

Total knee arthroplasty care delivery has experienced unprecedented transformation as healthcare systems embrace value-based care models, accelerated recovery protocols, and cost-containment strategies. Contemporary surgical success extends beyond traditional clinical metrics to encompass operational efficiency indicators including hospitalization duration, post-acute care pathways, and unplanned healthcare encounters. The evolution toward ambulatory and accelerated discharge TKA models exemplifies systematic healthcare redesign prioritizing rapid functional restoration while preserving patient safety standards. This investigation analyzes longitudinal trends in healthcare resource consumption following primary TKA, examining hospital stay duration, discharge patterns, early readmission frequencies, and revision surgery rates throughout an eight-year period of care pathway optimization.

METHODS:

A cohort analysis employing the Orthopaedic Minimal Data Set Episode of Care (OME) database encompassing consecutive primary TKA procedures from 2016-2023. The OME platform provides validated, comprehensive data infrastructure utilizing electronic documentation systems for real-time perioperative metrics capture. Key outcome measures included prolonged hospitalization (≥3 days), institutional discharge requirements, 90-day unplanned readmissions, and one-year revision procedures. Temporal trend analysis utilized chi-square methodology for categorical endpoints with targeted pairwise analyses to determine critical transition periods.

RESULTS:

Analysis of 11,542 patients revealed substantial healthcare efficiency improvements across multiple performance indicators. Prolonged hospital stays (≥3 days) decreased dramatically from 23.8% in 2016 to 5.60% in 2023, representing a 76% relative reduction ($p<0.001$). The steepest decline occurred during 2018-2020. Non-home discharge patterns demonstrated parallel optimization, declining from 12.3% in 2016 to 4.05% in 2023 ($p<0.001$). Home or home-based care discharge rates increased correspondingly from 87.7% to 95.9% across the study timeframe. Unplanned healthcare encounters showed favorable trajectories with 90-day readmission rates falling from 9.75% in 2016 to 5.00% in 2023 ($p<0.001$). One-year reoperation frequencies remained consistently minimal throughout the observation period, fluctuating between 2.41% and 5.44% annually without statistically significant temporal patterns ($p=0.018$).

DISCUSSION AND CONCLUSION:

This analysis of over 11,500 TKA procedures demonstrates a fundamental shift in surgical care paradigms, with three-quarters fewer patients requiring extended hospitalization while maintaining surgical safety standards. The data reveals that modern TKA has evolved from a traditional inpatient procedure to an increasingly streamlined intervention, with nearly 96% of patients now discharged home. Most significantly, these operational improvements occurred without compromising patient safety, as evidenced by concurrent reductions in readmission rates. These findings challenge conventional assumptions about post-surgical recovery requirements and provide a roadmap for healthcare systems seeking to optimize arthroplasty programs while delivering value-based care.