Real-world Assessment of Healthcare Expenditures and Opioid Intake Following Total Hip Arthroplasty in Medicare Advantage Beneficiaries

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OBJECTIVE

To evaluate the real-world impact of liposomal bupivacaine (LB) on healthcare costs and opioid consumption over 6 months following total hip arthroplasty (THA) procedures performed in hospital outpatient department settings

CONCLUSIONS

1. The use of LB for outpatient THA in Medicare Advantage-insured patients was associated with lower total healthcare costs over 6 months of post-surgical follow-up, with more pronounced cost savings for patients with low back pain
2. These data underscore the value of LB for not only providing postsurgical analgesia but also reducing costs for patients undergoing THA in outpatient care settings, particularly in the subset of patients (20%) with low back pain

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INTRODUCTION

- THA procedures are among the most frequently performed orthopedic procedures in the United States, with a projected estimate of 1.43 million procedures to be performed by 2040[1]
- THA procedures are increasingly performed in outpatient settings to reduce healthcare costs,[2,3] supported by clinical pathways and Centers for Medicare and Medicaid Services reimbursement policies, including the Transforming Episode Accountability Model (TEAM)[4,5]
  - Approximately half of all joint replacements will be performed in outpatient settings by 2026[6]
- Effective perioperative pain management is critical to facilitate patient recovery and reduce opioid consumption after outpatient THA[7,8]
- Liposomal bupivacaine (LB) is a nonopioid treatment that has been associated with decreased opioid consumption in patients undergoing THA procedures[9]
- The NOPAIN Act has expanded reimbursement for qualifying nonopioid therapies, such as LB, when used for Medicare fee-for-service beneficiaries undergoing outpatient procedures[10]
  - However, there is limited real-world data regarding LB use for outpatient THA in Medicare-insured patients

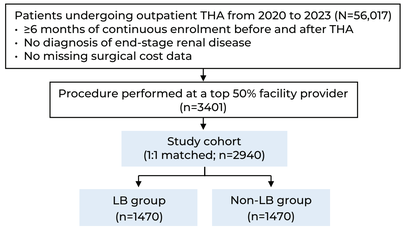
METHODS

- Adults undergoing a THA procedure in a hospital outpatient department (CPT code: 27130) between January 2020 and December 2023 were retrospectively identified from the Optum Clinformatics® database
  - Opioid-naive patients (ie, patients with no filled opioid prescription for 6 months to 7 days prior to the surgery date [as reported by their Medicare Advantage plan]) who had ≥6 months of continuous enrollment before or after THA, and had received THA in hospitals with moderate-to-high volume of LB use (ie, the top 50% of facility providers) were included in the analysis
- Patients were divided by LB use; the LB and non-LB cohorts were generated with 1:1 propensity score matching based on 12 covariates
  - Covariates used for propensity scoring were age, sex, race, Charlson Comorbidity Index (CCI), surgical year, region, anxiety, depression, chronic pain, low back pain, obesity, and diabetes
- Study outcomes were assessed over 6 months of follow-up after surgery
  - Healthcare costs included medical costs (emergency department, inpatient, outpatient, and skilled nursing facility costs) and pharmacy costs
  - Opioid intake was calculated in morphine milligram equivalents (MMEs)
- Outcomes were compared using generalized linear regression modeling with appropriate distributions, including Gamma and Tweedie distributions for costs and opioid intake (ie, MME), respectively

RESULTS

- The analytic cohort comprised 2940 patients (LB, n=1470; non-LB, n=1470) (Figure 1)

Figure 1. Sample population for retrospective analysis.



LB, liposomal bupivacaine; THA, total hip arthroplasty.

- After propensity score matching, patient characteristics were balanced between both groups (Table 1)
  - The mean age was 73 years, the mean CCI was 1.4, and ~36% of patients had a history of low back pain

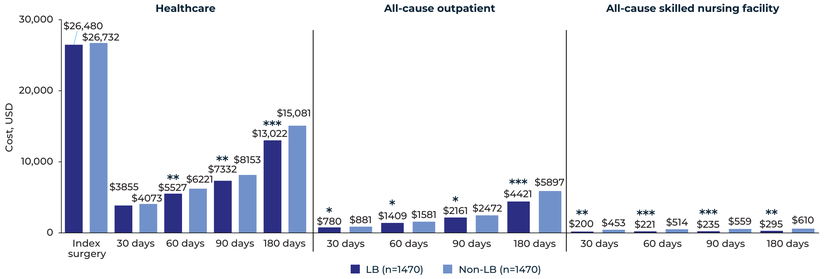
Table 1. Baseline Demographic and Clinical Characteristics

	PS-matched non-LB group (n=1470)	PS-matched LB group (n=1470)	PS-matched standardized mean difference, %
Age, mean (SD), y	73.5 (5.9)	73.4 (5.9)	-1.5
Sex, n (%)			
Female	884 (60.1)	858 (58.4)	-3.6
Male	586 (39.9)	612 (41.6)	3.6
Race, n (%)			
White	1237 (84.1)	1239 (84.3)	0.4
Non-White	233 (15.9)	231 (15.7)	-0.4
CCI, mean (SD)	1.4 (1.8)	1.4 (1.8)	-2.3
Comorbidities at baseline, n (%)			
Anxiety	237 (16.1)	223 (15.2)	-2.6
Depression	218 (14.8)	219 (14.9)	0.2
Chronic pain	300 (20.4)	299 (20.3%)	-0.2
Low back pain	526 (35.8)	537 (36.5)	1.6
Obesity	430 (29.3)	436 (29.7)	0.9
Diabetes	285 (19.4)	279 (19.0)	-1.0
Procedure year, n (%)			
2020	117 (8.0)	138 (9.4)	-5.2
2021	334 (22.7)	325 (22.1)	1.4
2022	472 (32.1)	483 (32.9)	-1.6
2023	547 (37.2)	524 (35.6)	3.2

CCI, Charlson Comorbidity Index; LB, liposomal bupivacaine; PS, propensity score; SD, standard deviation.

- While there was no difference in the cost on the day of surgery between the 2 groups, total healthcare costs (ie, medical and pharmacy costs) were numerically lower in the LB group than the non-LB group over 30 days after surgery ($218 reduction; *P*=0.190), and were significantly lower over 60 days ($694 reduction; *P*=0.003), 90 days ($821 reduction; *P*=0.007), and 180 days ($2059 reduction; *P*=0.001) after surgery (Figure 2)
- Total healthcare cost savings were generally driven by lower outpatient and skilled nursing facility costs in the LB group versus the non-LB group
  - Total all-cause outpatient costs were significantly lower in the LB group than the non-LB group over 30 days ($101 reduction; *P*=0.025), 60 days ($172 reduction; *P*=0.035), 90 days ($311 reduction; *P*=0.015), and 180 days ($1476 reduction; *P*<0.001) after surgery
  - Total all-cause skilled nursing facility costs were significantly lower in the LB group than the non-LB group over 30 days ($253 reduction; *P*=0.001), 60 days ($293 reduction; *P*=0.0005), 90 days ($324 reduction; *P*=0.0003), and 180 days ($315 reduction; *P*=0.002) after surgery

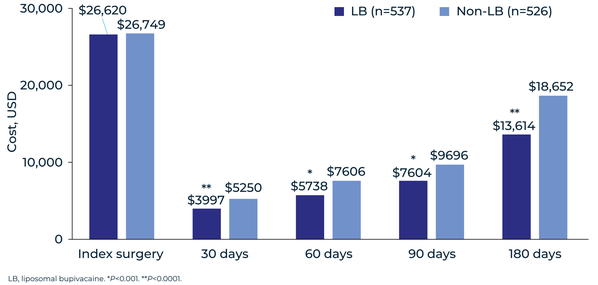
Figure 2. Healthcare, all-cause outpatient, and all-cause skilled nursing facility cost comparisons between the LB and non-LB cohorts.



LB, liposomal bupivacaine. *P<0.05. **P<0.01. ***P<0.001.

- Healthcare cost savings were more pronounced in the subgroup of patients with low back pain; patients in the LB group had significantly lower total costs compared with those in the non-LB group over 30 days ($1253 reduction; *P*=0.001), 60 days ($1868 reduction; *P*=0.001), 90 days ($2091 reduction; *P*=0.004), and 180 days ($5038 reduction; *P*=0.001) after surgery (Figure 3)

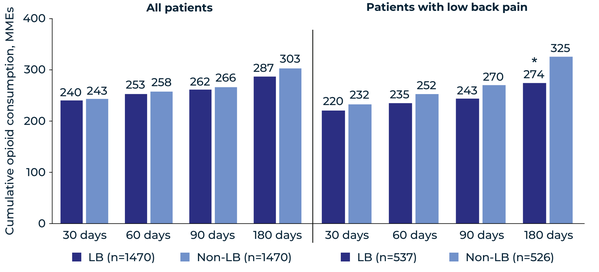
Figure 3. Healthcare cost comparisons between the LB and non-LB cohorts for patients with low back pain.



LB, liposomal bupivacaine. *P<0.001. **P<0.0001.

- Opioid consumption was similar in both groups during follow-up after surgery (Figure 4)
  - Opioid consumption was numerically lower with LB versus non-LB analgesia over 30 days (240 vs 243 MMEs; *P*=0.763), 60 days (253 vs 258 MMEs; *P*=0.657), 90 days (262 vs 266 MMEs; *P*=0.669), and 180 days (287 vs 303 MMEs; *P*=0.209) after surgery
  - Among the subgroup of patients with low back pain, opioid consumption was significantly lower with LB than non-LB analgesia over 180 days after surgery (274 vs 325 MMEs; *P*=0.027) and numerically lower with LB versus non-LB analgesia at all other follow-up timepoints

Figure 4. Opioid consumption comparisons between the LB and non-LB cohorts.



LB, liposomal bupivacaine; MME, morphine milligram equivalent. *P<0.05.