

## Outcomes and Costs in Heart Failure Patients Undergoing Total Hip Arthroplasty

### Introduction

Total hip arthroplasty (THA) is extremely common to treat symptoms of degenerative OA and those with HF are at greater risk of complications following non-cardiac surgical procedures. This study aims to use a large nationwide database to examine outcomes and costs in HF patients undergoing THA.

### Methods

Primary, elective THA patients were queried from the Premier Healthcare Database (PINC, AI Applied Sciences, 2016-2022). Patients were excluded for revision, infection, or fracture-related procedures. Age, sex, race, ethnicity, insurance, and Elixhauser Comorbidity Index (ECI) were included. Additionally, HF diagnosis was recorded, and patients were divided into two cohorts: HF and non-HF. Outcomes included index facility costs, 90-day complications, and 90-day readmission compared between the two cohorts using univariate analysis and multivariable analysis to adjust for demographics and clinical factors.

### Results

A total of 498,430 patients were included, 3.2% of which had HF. HF patients cohort were older ( $71.9 \pm 0.08$  vs  $66.3 \pm 0.01$ ,  $p < 0.001$ ), had more comorbidities (ECI  $4.56 \pm 0.01$  vs  $1.76 \pm 0.00$ ,  $p < 0.001$ ), were more often male (51% vs 44%,  $p < 0.001$ ) and Black-identifying (12% vs 8%,  $p < 0.001$ ), had greater lengths of stay ( $2.25 \pm 0.02$  vs  $1.35 \pm 0.00$ ,  $p < 0.001$ ), and more likely to be insured by Medicare (78% vs 57%,  $p < 0.001$ ). Univariate analysis revealed HF patients had significantly greater rates of readmissions (12% vs 6%,  $p < 0.001$ ) and complications (4% vs 1%,  $p < 0.001$ ), as well as greater costs ( $\$17604.77 \pm 74.78$  vs  $\$15370.93 \pm 13.77$ ,  $p < 0.001$ ). Adjusted analysis showed significantly greater risk of overall complications (OR 1.30, 95% CI: 1.18-1.43,  $p < 0.001$ ), readmission (OR 1.23, 95% CI: 1.14-1.33,  $p < 0.001$ ), and greater costs by  $\$845.67$  (95% CI:  $\$684.98$ - $\$1006.35$ ,  $p < 0.001$ ) in HF patients.

### Conclusion

HF is associated with worse outcomes and greater costs following THA. Future work should aim to examine specific factors that contribute to these findings. Additionally, orthopedic providers should aim to collaborate with HF specialists to mitigate these outcomes and optimize perioperative care.

**Table 1. Demographics and Characteristics by Heart Failure Diagnosis in Individuals Undergoing Primary Total Hip Arthroplasty (N=498,430)**

<b>Variable</b>	<b>No Heart Failure (N=482,704)</b>	<b>Heart Failure (N=15,726)</b>	<b>p-value</b>
Age in years (Mean ± SE)	66.27 (0.01)	71.91 (0.08)	<0.001
Length of Stay (Mean ± SE)	1.35 (0.00)	2.25 (0.02)	<0.001
Elixhauser Comorbidity Index (Mean ± SE)	1.76 (0.00)	4.56 (0.01)	<0.001
Sex			<0.001
Female	269734 (0.56)	7688 (0.49)	
Male	212970 (0.44)	8038 (0.51)	
Race			<0.001
Asian	3771 (0.01)	63 (0)	
Black	40740 (0.08)	1874 (0.12)	
Other	13442 (0.03)	369 (0.02)	
White	424751 (0.88)	13420 (0.85)	
Ethnicity			<0.001
Hispanic	14608 (0.03)	332 (0.02)	
Non-Hispanic	468096 (0.97)	15394 (0.98)	
Payer			<0.001
Medicaid	21694 (0.04)	647 (0.04)	
Medicare	276553 (0.57)	12404 (0.79)	
Other	15411 (0.03)	370 (0.02)	
Private	166529 (0.34)	2253 (0.14)	

Uninsured	2517 (0.01)	52 (0)	
Index Stay Facility Costs	15370.93 (13.77)	17604.77 (74.48)	<0.001
90-Day Readmission			<0.001
No	176924 (0.94)	7077 (0.88)	
Yes	10583 (0.06)	1009 (0.12)	
Complications			<0.001
No	477507 (0.99)	15070 (0.96)	
Yes	5197 (0.01)	656 (0.04)	
Acute Myocardial Infarction			<0.001
No	482476 (1)	15607 (0.99)	
Yes	228 (0)	119 (0.01)	
Pneumonia			<0.001
No	481801 (1)	15500 (0.99)	
Yes	903 (0)	226 (0.01)	
Sepsis/Shock			<0.001
No	482252 (1)	15582 (0.99)	
Yes	452 (0)	144 (0.01)	
Surgical Site Bleed			<0.001
No	482442 (1)	15707 (1)	
Yes	262 (0)	19 (0)	
Pulmonary Embolism			<0.001
No	482415 (1)	15690 (1)	
Yes	289 (0)	36 (0)	
Mechanical			<0.001

No	482297 (1)	15688 (1)	
Yes	407 (0)	38 (0)	
Joint/Wound Infection (JWI)			<0.001
No	482558 (1)	15705 (1)	
Yes	146 (0)	21 (0)	
Column data reported as number of patients (%) or mean ± standard error (SE)			