

# Two-Year Outcomes Following Total Hip Replacement with ACTIS – A Matched Comparative Analysis from a US Healthcare System

## OBJECTIVES

- Total hip replacement (THR) procedures are generally successful. The ACTIS™ Hip Stem was shown in early research to be associated with lower revision rates following THR compared to other implants.
- This study evaluates 2-year survivorship of matched cohorts of patients treated with ACTIS Hip Stem vs comparators.



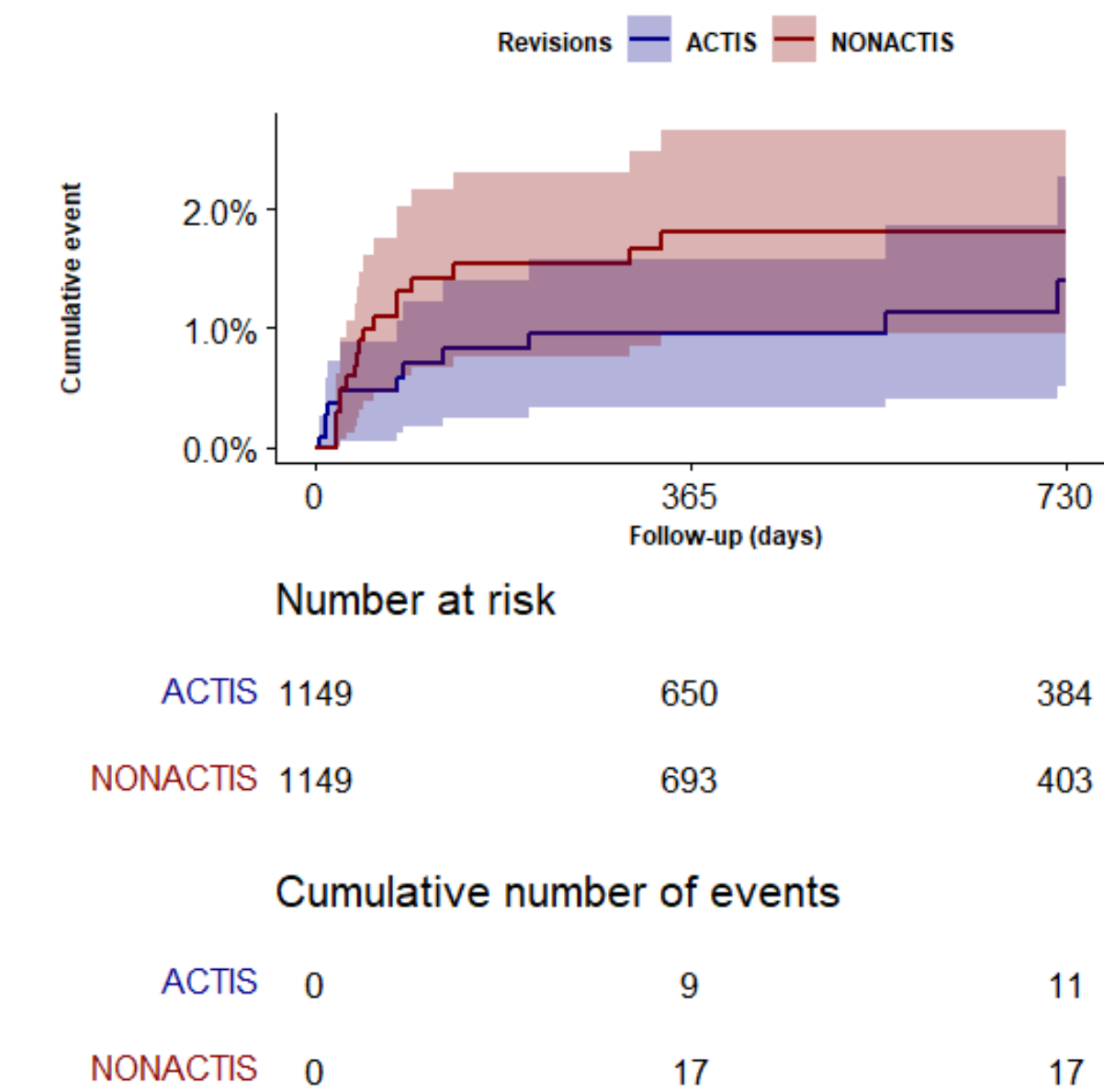
## METHODS

- This retrospective observational cohort study used EMR data from the Mercy Healthcare System – Orthopedics Database (MHSOD). The MHSOD dataset includes fully deidentified patient data from the Mercy Health hospital network, covering more than 40 hospitals, 900 physician practices and outpatient facilities, and 3,400 integrated providers<sup>1</sup>.
- Patients with THR from 2016 to most recent (June 2021) within the Mercy Healthcare System's database were identified and categorized based on implant ACTIS Hip Stem vs other hips. Surgical approach data was not available.
- The primary outcome was 2-year cumulative revision rate. Secondary outcomes included operating room (OR) time, length of hospital stay (LOS) and discharge disposition.
- Variables were patient demographics and comorbidities (Elixhauser Index (EI) and each individual disease domain included in the EI), surgery and provider characteristics and implant used.
- Patients with the ACTIS Hip Stem vs other hips were matched using propensity scores on surgery year, patient age, gender and comorbidities (R package: MatchIT, nearest neighbor method, glm distance). Kaplan-Meier survival analyses and Cox models were developed. Chi-square significance tests were performed for all other outcomes.

## RESULTS

- 2,298 matched patients (1,149 ACTIS vs 1,149 control; In each group: 54% female, mean age: 66.0 years (SD: 10.9), mean EI: 2.6 (SD: 1.8), 43% obese) were included in the analysis.
- Two-year revision rates for ACTIS vs other hips were 1.39% (95%CI: 0.51%-2.26%) and 1.81% (95%CI: 0.95%-2.66%), respectively, with a hazard ratio of 0.67 (0.31-1.42). (Figure 1). Three-year revision rate for ACTIS was 1.4% (95%CI 0.6%-2.1%).

**Figure 1.** Two-year survivorship of matched cohorts of patients treated with ACTIS vs other hips



- The ACTIS Hip System demonstrated:
  - 15-minute reduction in OR time** (112.3 (SD: 22.41) vs 127.65 (SD: 32.07) minutes, p<0.001)\*
  - 0.21 days decrease in hospital length of stay** (1.96 (SD: 1.02) vs 2.17 (SD: 1.32), p<0.001)
  - 95.87% decrease in home help** (2.26% vs 54.66%, p<0.001)
  - 49.54% decrease in skilled nursing facilities (SNF)** (4.35% vs 8.62%, p<0.001)

VARIABLE	ACTIS	CONTROL	ACTIS COST	CONTROL COST	SAVING
OR Time (Minutes)*	112.30	127.65	\$4092.50	\$4652.05	\$559.56
LOS (Days)	1.96	2.17	\$2272.68	\$2516.36	\$243.68
HHA Use (%)	2.26%	54.66%	\$53.27	\$1286.61	\$1233.34
SNF Use (%)	4.35%	8.62%	\$146.82	\$290.71	\$143.89
<b>Total savings per patient, per year -</b>					<b>\$2180.47</b>

\*In room to Out room duration

- The ACTIS Hip System demonstrated significantly fewer complications due to fracture (0.46% vs 1.71%, p=0.028) and deep infection (0.15% vs 1.28%, p=0.015) at 1 year follow up.

## REFERENCES

- <https://www.mercy.net/about/>
- Miller LE, Kamath AF, Boettner F, Bhattacharyya SK. *In-hospital outcomes with anterior versus posterior approaches in total hip arthroplasty: meta-analysis of randomized controlled trials.* Journal of Pain Research. 2018 Jan 1;11:1327-34.

## CONCLUSIONS

- Tissue sparing approaches, such as the anterior approach, have been shown to increase OR time (Mean increase of 16 minutes vs posterior approach).<sup>2</sup>
- The ACTIS Hip Stem was designed specifically to be used in tissue sparing approaches, and in this matched cohort study is shown to decrease OR time by 15 minutes (p<0.001).
- One of the limitations of this study is the absence of data on surgical approach. However, it is possible that the intentional design of the femoral implant and instrumentation can reduce the impact of surgical approach on OR time.
- In this matched cohort study, patients receiving the ACTIS Hip System had a shorter duration of surgery, a shorter hospital LOS, and were more likely to be discharged home and less likely to be discharged to a SNF. **This led to a per patient, per year cost saving of \$2180.47.**
- Over a 2-year follow-up period, compared to patients receiving other hips, fewer patients receiving the ACTIS Hip System had complications and revisions.