## Early Performance of a Modern Triple-Tapered Collared Cementless Stem in Primary Total Hip Arthroplasty: An American Joint Replacement Registry Study

Elizabeth Gausden, Manoshi Bhowmik-Stoker<sup>1</sup>, Ahmad Faizan<sup>2</sup>, Jeremy Gililland<sup>3</sup>, Geoffrey H Westrich<sup>4</sup>, Colin Neitzke<sup>5</sup>, Cory L Calendine

<sup>1</sup>Stryker Orthopaedic, <sup>2</sup>Stryker, <sup>3</sup>University of Utah, <sup>4</sup>Hospital for Special Surgery, <sup>5</sup>Hospital For Special Surgery

INTRODUCTION: Periprosthetic femoral fractures (PPF) are a leading cause of revision following primary hip arthroplasty. While triple-tapered, cementless, collared stems have been associated with a lower incidence of PPFs, most studies are from single institutions. The purpose of this work was to investigate PPF incidence and early device survivorship of a modern-designed cementless collared stem as reported in the American Joint Replacement Registry (AJRR) in patients over 65 years of age.

METHODS: All primary THA cases in patients over 65 years of age from January 2021 – December 2022 submitted to AJRR as of March 2024 with Medicare data and were queried in this 1-year analysis. Data was stratified into three treatment groups: triple-tapered cementless collared stems, cementless collarless stems, and cemented stems. This analysis included 1,368 triple-tapered cementless collared stems, 40,244 cementless collarless stems, and 4,744 cemented stems. Cumulative 1-year revision and 1-year PPF incidence, per ICD 9 and 10, were determined. AJRR data was linked to Medicare claims data through a unique identifier provided by the Research Data Assistance Center (ResDAC).

## **RESULTS:**

This modern triple-tapered cementless collared stem had the lowest all-cause 1-year revision incidence of 0.51% in comparison to cemented (1.5%) and cementless collarless (1.76%) groups (p<0.001) (Figure 1).

There were just 2 PFFs identified in the cementless collared cohort (0.15%) which was equivalent to the cemented cohort (0.15%) (p=0.99). The 1-year PPF incidence was significantly lower for the cementless collared cohort than the cementless collarless cohort (0.15% v. 0.61%, p<0.001).

DISCUSSION AND CONCLUSION: In this large retrospective cohort from AJRR data, there was a significantly lower 1year all-cause revision with a modern triple taper cementless collared stem compared to cementless collarless stems. Notably, the incidence of PPF with a cementless collared stem was significantly lower than cementless collarless stems and equivalent to cemented stems.



Figure 1: Cumulative percentage revision rate adjusted for age and sex.