

# Modular Dual Mobility (MDM®) clinical evidence

## Cost Analysis of Dual-Mobility vs. Large Femoral Head Constructs in Revision Total Hip Arthroplasty

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### Study objective:

The purpose of this study was to report costs of dual mobility (DM) vs. large femoral head (LFH) constructs in revision THA from a healthcare payer perspective.

### Background:

- Dual mobility and large femoral head constructs have been shown to lower dislocation risk compared to smaller diameter femoral heads<sup>1,2</sup>.
- While DM constructs have proven to be cost effective in primary THA<sup>3,4</sup>, cost analyses in revision THA are lacking.
- The authors previously reported that patients treated with DM cups in revision THA had lower dislocation and reintervention rates compared to LFH cups over 3.6 years mean follow-up<sup>5</sup>.

### Materials and methods:

- A Markov model was constructed to analyze costs of subsequent re-interventions in patients who underwent revision THA with DM or LFH implants (**Figure 1**).
- Model states and probabilities were derived from prospectively collected registry data in patients who underwent unilateral revision THA with a DM (n=126) or 40 mm LFH (n=176) construct.
- Medicare costs were estimated as the weighted-average national Medicare payment for revision THA (**Table 1**).
- Private payer costs were estimated by using a multiplier of Medicare costs. Probabilistic sensitivity analysis examined the effect of combined uncertainty across all model parameters (**Table 1**).

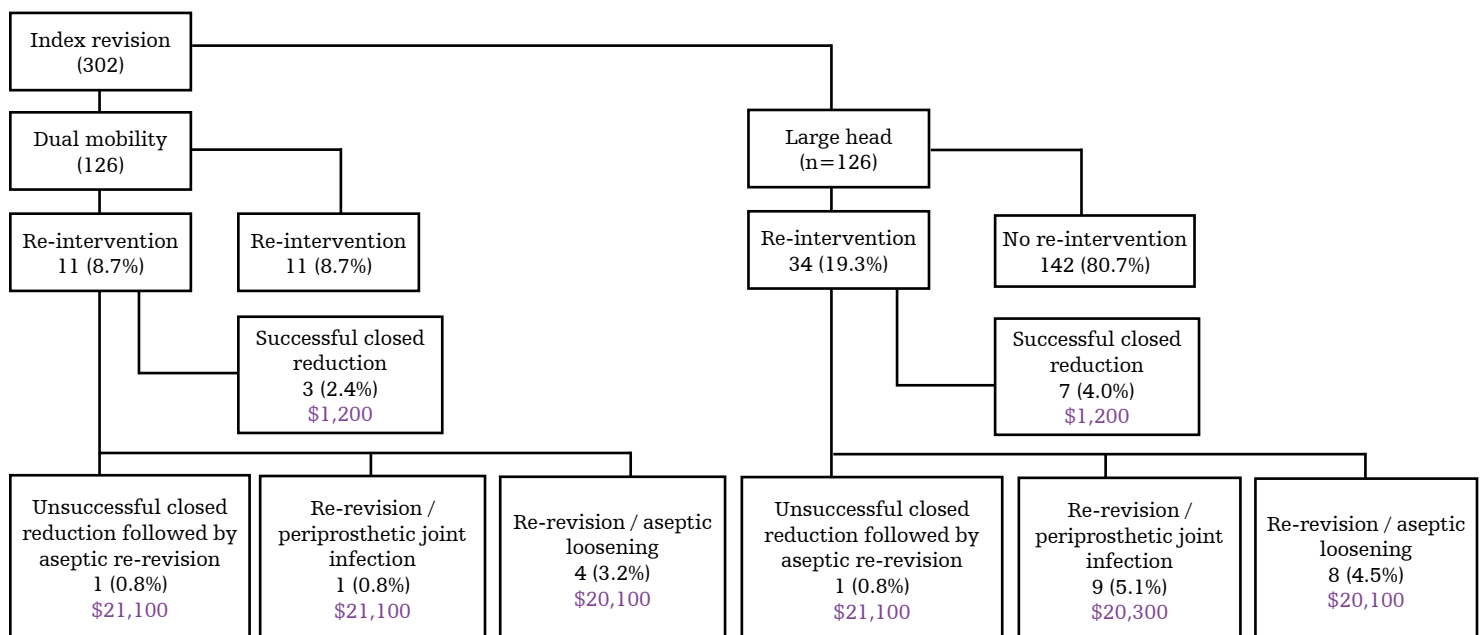


Figure 1: Markov model states, probabilities and Medicare estimated costs

**Table 1.** Healthcare payers costs of dual mobility and large femoral head constructs by post-revision year.

| Year                                | Proportion stable patient | Proportion re-revision for peri-prosthetic joint infection | Proportion procedure for hip dislocation | Proportion re-revision for aseptic loosening | Medicare annual cost | Medicare cumulative | Private payer annual cost | Private payer cumulative cost |
|-------------------------------------|---------------------------|------------------------------------------------------------|------------------------------------------|----------------------------------------------|----------------------|---------------------|---------------------------|-------------------------------|
| <b>Dual mobility construct</b>      |                           |                                                            |                                          |                                              |                      |                     |                           |                               |
| 1                                   | 0.929                     | 0.024                                                      | 0.024                                    | 0.024                                        | \$704                | \$704               | \$1,182                   | \$1,182                       |
| 2                                   | 0.997                     | 0.001                                                      | 0.001                                    | 0.001                                        | \$25                 | \$729               | \$42                      | \$1,224                       |
| 3                                   | 0.978                     | 0.001                                                      | 0.010                                    | 0.010                                        | \$236                | \$965               | \$397                     | \$1,621                       |
| <b>Large femoral head construct</b> |                           |                                                            |                                          |                                              |                      |                     |                           |                               |
| 1                                   | 0.818                     | 0.051                                                      | 0.097                                    | 0.034                                        | \$2,216              | \$2,216             | \$3,723                   | \$3,723                       |
| 2                                   | 0.992                     | 0.001                                                      | 0.001                                    | 0.006                                        | \$132                | \$2,349             | \$222                     | \$3,946                       |
| 3                                   | 0.992                     | 0.001                                                      | 0.001                                    | 0.007                                        | \$143                | \$2,491             | \$240                     | \$4,186                       |

**Results:**

- Over a 3-year period following revision THA, re-interventions were performed in 11 (9%) DM patients and 34 (19%) LFH patients.
- Re-interventions cost Medicare between \$263 and \$1,898 with 95% probability in DM THAs and between \$1,285 and \$3,946 in LFH THAs.
- Re-interventions cost private payers between \$356 and \$3,102 with 95% probability in DM THAs and between \$2,075 and \$6,768 in LFH THAs.
- Dual-mobility constructs were less costly to Medicare compared to LFH implants (\$960 vs. \$2,495, respectively), resulting in a cost differential of \$1,536.
- Dual mobility constructs were less costly to private payers compared to LFH implants (\$1,642 vs. \$4,253), resulting in a cost differential of \$2,611.

**Conclusion:**

- DM constructs utilized in revision THAs were associated with a significantly lower absolute risk of re-intervention (~11% lower) and lower healthcare payer costs (saving \$1,500-\$2,500 per case) compared to LFH constructs.
- The results of this study demonstrated a cost savings to healthcare payers with DM constructs relative to conventional LFH constructs over 3-year follow-up in revision THA.

**Limitations:**

- Potential imbalances in baseline group characteristics could influence reintervention rates.
- Healthcare payer costs were estimated using national-average Medicare payments (MS-DRGs) instead of actual reimbursements.
- Clinical data were reported from a single high-volume institution.

**References:**

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