Jump distance

Raising the bar with Modular Dual Mobility (MDM®)

Key takeaways

- Dual mobility has been shown to increase hip stability by providing greater implant jump distances compared to conventional polyethylene liners.[1,2]
- Stryker's MDM achieved greater jump distances when compared to Smith+Nephew OR3O™ and Zimmer Biomet G7® dual mobility with numerical methods (CAD analysis).[3,4]
- Stryker's 32 mm X3 polyethylene liners also demonstrated greater jump distances when compared to many competitive sizes of dual mobility (see graph).[3,4]

Why is jump distance important?

Implant instability resulting in hip dislocation is a known complication after THA. A potential advantage of dual mobility implants is that they can enhance hip stability by providing larger femoral head diameters that increase jump distance of the bearing, or the distance the femoral head must travel to dislocate from the implant (Fig.1).[1]

The greater the implant jump distance, the lower the THA dislocation risk.[2]

Factors that may affect jump distance include implant head diameter, design geometry of the implant bearing surface, position of the acetabular shell and orientation of the pelvis.[2]

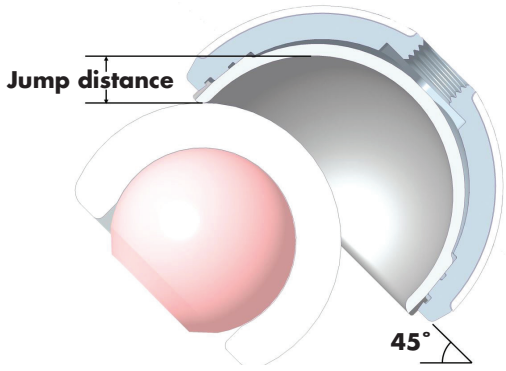


Fig. 1

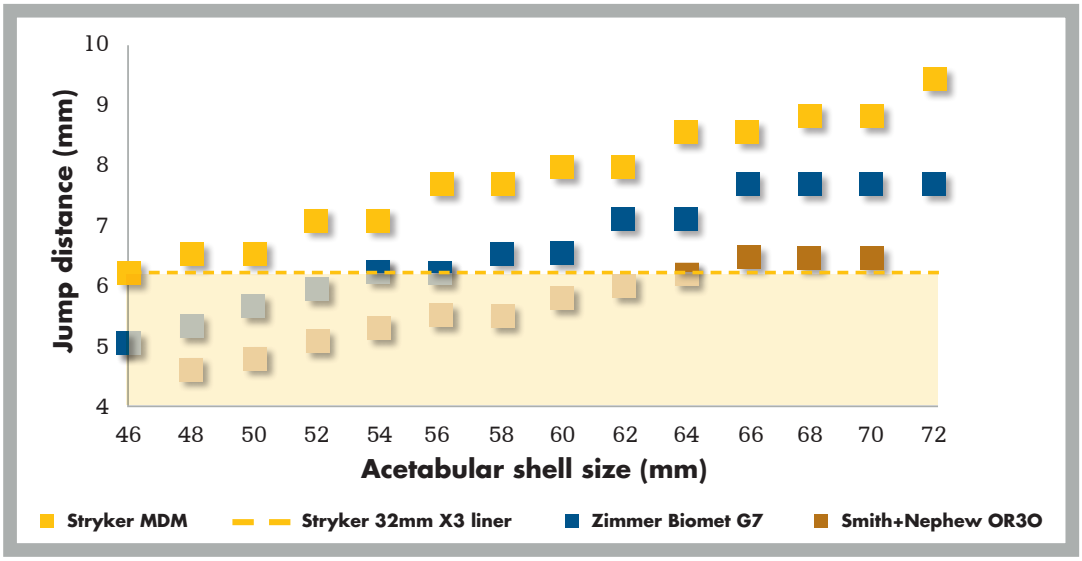
Measurement of jump distance.

Jump distance comparison

Jump distances were compared for MDM and other competitive systems in addition to a 32 mm polyethylene liner. Implants were oriented at 45° inclination, and jump distances were calculated by numerical methods using CAD software. The results presented here may be different in clinical practice.

As a baseline for comparing the concept of jump distance, conventional polyethylene liners with a fixed femoral head increase jump distance by 18% when using a 32 mm femoral head versus 28 mm.[3,4]

MDM vs. the competition



MDM achieved an average of:

- **37% greater** jump distance than OR3O[4]
- **18% greater** jump distance than G7[3]

Raising the bar

Stryker's MDM versus the competition

- Through numerical methods (CAD analysis), MDM showed the greatest jump distance as compared to corresponding same-sized shells from two competitive dual mobility systems.[3,4] On average, **MDM demonstrated a 37% and 18% increase in jump distance over the OR3O and G7 systems,** respectively.[3,4]
- MDM achieved a larger jump distance by providing more than 180° of poly insert coverage via a 2.4 mm cylindrical buildup of the liner. This feature allows for greater jump distance for a given polyethylene head diameter (Fig. 2). In contrast, the OR3O and G7 liners provide 170° and 180° of poly insert coverage, respectively.[3,4]

Stryker's X3 liners versus the competition

- **32 mm polyethylene liners demonstrated a larger jump distance** versus OR3O in shells sizes up to 62 mm and G7 sizes up to 52 mm.[3,4]
- Similar to MDM, the X3 polyethylene liners provide more than 180° of femoral head coverage via a 2.7 mm cylindrical buildup (Fig. 3).[3]

Trident II Tritanium with MDM

Fig. 2

Trident II PSL HA Shell with X3 liner

Fig. 3

References:
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2. Nevelos J, Johnson A, Heffernan C, Macintyre J, Markel DC, Mont MA. What factors affect posterior dislocation distance in THA? Clin Orthop Relat Res. 2013;471(2):519-526. doi:10.1007/s11999-012-2559-1
3. Stryker Internal Technical Memo A0012226. 2D Jump Distance comparison for MDM and G7. March 2016.
4. Stryker Internal Technical Memo D0000055054. 2D Jump Distance comparison for MDM and OR3O. July 2020.

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