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Comparison of survivorship for OXINIUM®/XLPE with other bearing combinations in primary THA: review of international registry data

Key points

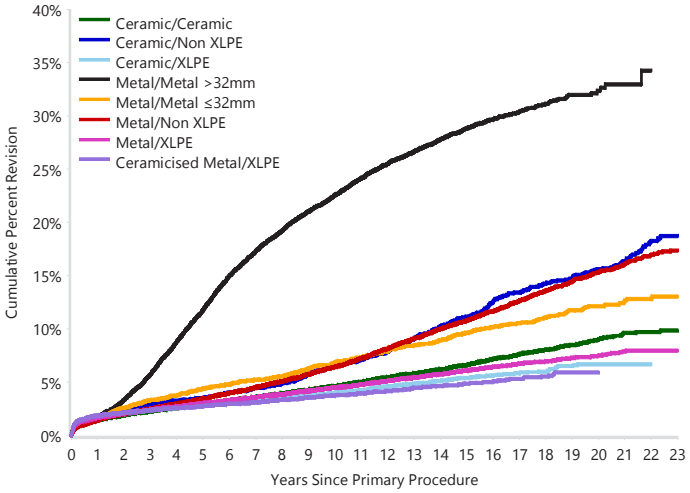
4 registries demonstrated OXINIUM/XLPE has the **lowest revision risk** of all modern bearing combinations[1–4]

≥ 94.1% mid- to long-term **survivorship**[1–4]

3 registries showed OXINIUM/XLPE delivers higher survivorship than ceramic/XLPE [1,3,4]

OXINIUM/XLPE has the highest survivorship of all bearing combinations at 20 years[1]

Australian Orthopaedic Association National Joint Replacement Registry (AOANJRR)



20 years 94.1% survivorship

Number at Risk	0 Yr	1 Yr	3 Yrs	5 Yrs	10 Yrs	15 Yrs	20 Yrs
Ceramic/Ceramic	110883	105160	94772	83649	48132	17459	4241
Ceramic/Non XLPE	10753	9718	8080	6612	3712	2216	1003
Ceramic/XLPE	166184	140708	101851	69562	19319	4434	576
Metal/Metal >32mm	14424	14063	13212	11973	9295	5479	267
Metal/Metal ≤32mm	5143	5022	4841	4653	3980	2879	1071
Metal/Non XLPE	36113	34632	32153	29458	21118	12175	4263
Metal/XLPE	207814	190898	162953	134374	63972	19115	2755
Ceramicised Metal/XLPE	37758	33779	26857	20952	9518	2778	143

Note: Only bearing surfaces with >5,000 procedures have been listed

Figure HT34 Cumulative Percent Revision of Primary Total Conventional Hip Replacement by Bearing Surface (Primary Diagnosis OA)

HR - adjusted for age and gender

Ceramic/Ceramic vs Metal/XLPE
Entire Period: HR=0.98 (0.95, 1.02), p=0.387

Ceramic/Non XLPE vs Metal/XLPE
0 - 2Yr: HR=1.16 (1.02, 1.32), p=0.026
2Yr - 3.5Yr: HR=1.42 (1.11, 1.83), p=0.005
3.5Yr - 5Yr: HR=0.90 (0.63, 1.29), p=0.567
5Yr - 8Yr: HR=1.49 (1.19, 1.86), p<0.001
8Yr+: HR=2.65 (2.36, 2.97), p<0.001

Ceramic/XLPE vs Metal/XLPE
0 - 2Yr: HR=1.01 (0.97, 1.06), p=0.617
2Yr+: HR=0.76 (0.72, 0.81), p<0.001

Metal/Metal >32mm vs Metal/XLPE
0 - 2Wk: HR=1.28 (0.96, 1.69), p=0.087
2Wk - 1Mth: HR=0.45 (0.31, 0.66), p<0.001
1Mth - 9Mth: HR=0.95 (0.79, 1.15), p=0.604
9Mth - 1.5Yr: HR=2.82 (2.38, 3.33), p<0.001
1.5Yr - 2Yr: HR=4.40 (3.66, 5.29), p<0.001
2Yr - 3Yr: HR=6.46 (5.73, 7.28), p<0.001
3Yr - 8Yr: HR=9.49 (8.95, 10.05), p<0.001
8Yr - 10Yr: HR=5.99 (5.35, 6.71), p<0.001
10Yr - 12Yr: HR=4.96 (4.39, 5.61), p<0.001
12Yr+: HR=3.36 (3.02, 3.74), p<0.001

Metal/Metal ≤32mm vs Metal/XLPE
Entire Period: HR=1.44 (1.32, 1.58), p<0.001

Metal/Non XLPE vs Metal/XLPE
0 - 1Mth: HR=0.73 (0.62, 0.85), p<0.001
1Mth - 6Mth: HR=0.90 (0.78, 1.04), p=0.145
6Mth - 3.5Yr: HR=1.42 (1.30, 1.54), p<0.001
3.5Yr - 5Yr: HR=1.57 (1.37, 1.81), p<0.001
5Yr - 7Yr: HR=1.74 (1.54, 1.96), p<0.001
7Yr - 10Yr: HR=2.15 (1.95, 2.38), p<0.001
10Yr+: HR=2.60 (2.42, 2.79), p<0.001

Ceramicised Metal/XLPE vs Metal/XLPE
0 - 6Mth: HR=1.17 (1.07, 1.28), p<0.001
6Mth - 1Yr: HR=1.03 (0.84, 1.25), p=0.789
1Yr+: HR=0.62 (0.57, 0.68), p<0.001

38% From 1 year, OXINIUM/XLPE has the **lowest risk of revision** of all bearing combinations vs metal/XLPE (p<0.001)

Comparing the rates of revision for these bearings, Ceramicised Metal/XLPE* has the lowest rate of revision at 20 years. As in previous years, the Registry urges caution in the interpretation of this result. This bearing is a single company product, used with a small number of femoral stem and acetabular component combinations. This may have a confounding effect on the outcome, making it unclear if the lower rate of revision is an effect of the bearing surface or reflects the limited combinations of femoral and acetabular prostheses. Tables and graphs have been reproduced in exact and complete form.
*The term 'Ceramicised Metal/XLPE' is equivalent to 'OXINIUM/XLPE'.

OXINIUM◊/XLPE demonstrates the joint highest survivorship of all bearing combinations at 15 years[2]

National Joint Registry (NJR) of England, Wales, Northern Ireland, the Isle of Man and the States of Guernsey†

- Analysis of 1,026,481 primary THAs, including 21,263 patients with OXINIUM/XLPE over 15 years follow-up (bearing usage from 2003 to 2019)

35% ↓
Lowest risk of revision of all bearing combinations (p<0.001)

at 15 years
1.3%
Cumulative rates of revision (all cause) for OXINIUM/XLPE were the **joint lowest** of all bearings

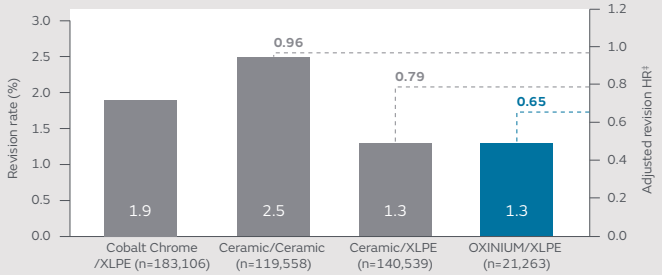


Figure. Cumulative incidence of revision for any reason and adjusted hazard ratios (HRs)
‡HRs were adjusted for year of primary surgery, patient gender, age, BMI, ASA physical status grade, implant fixation, shell component materials, stem component materials, and head size at 10 years compared to the reference group (Cobalt Chrome/XLPE primary THA).

OXINIUM/XLPE has the highest 5-year and 9-year survivorship of all bearing combinations[3]

Dutch Arthroplasty Register (LROI)

- Analysis of 209,912 primary THAs with a maximum 10 years' follow-up (bearing usage from 2007 to 2016)

Cumulative rates of revision (all cause) for OXINIUM/(XL)PE were the lowest of all bearings

at 5 years **2.5%**
at 9 years **3.5%**

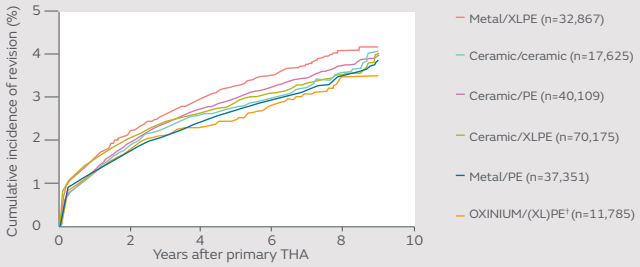


Figure. Cumulative incidence of revision according to bearing type of THA
§Due to small group sizes, OXINIUM on standard polyethylene (PE) or highly-cross-linked polyethylene (XLPE) were analysed together.

OXINIUM/XLPE has the highest 10-year survivorship of all bearing combinations[4]

Italian Register of Orthopaedic Prosthetic Implants (RIPO)

- Analysis of 20,963 uncemented THAs from 68 orthopaedic units, performed between 2000 and 2015 with 10 years' follow-up

59% ↓
Lower risk of revision compared to Metal/XLPE at 10 years

54% ↓
Lower risk of revision compared to Ceramic/ceramic at 10 years

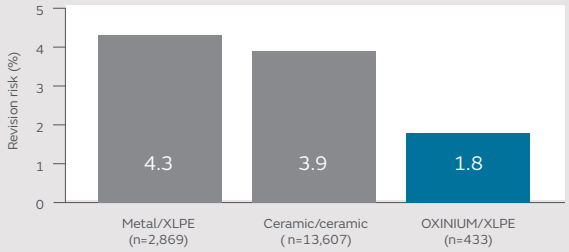


Figure. Revision risk by bearing type at 10 years
Insufficient patient numbers at 10 years to estimate failure risk for Ceramic/XLPE. Failure risk of 3.1% calculated at 5 years.

Conclusions

OXINIUM with XLPE has been shown to consistently deliver superior mid- to long-term survivorship and the lowest revision risk compared to all other modern bearing combinations in four arthroplasty registries.

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References: 1. Australian Orthopaedic Association National Joint Replacement Registry (AOANJRR) Hip, Knee & Shoulder Arthroplasty: 2024 Annual Report Adelaide; AOA, 2024:1–629. Available at: https://aoanjrr.sahmri.com/annual-reports-2024. Accessed December 11, 2024. **2.** Whitehouse MR, Patel R, French JMR, et al. The association of bearing surface materials with the risk of revision following primary total hip replacement: a cohort analysis of 1,026,481 hip replacements from the National Joint Registry. PLoS Med 2024;21(11):e1004478. **3.** Peters RM, Van Steenbergen LN, Stevens M, Rijk PC, Bulstra SK, Zijlstra WP. The effect of bearing type on the outcome of total hip arthroplasty. *Acta Orthop.* 2018:89(2);163–169. **4.** Atrey A, Ancarani C, Fitch D, Bordini B. Impact of bearing couple on long-term component survivorship for primary cementless total hip replacement in a large arthroplasty registry. Poster presented at: Canadian Orthopedic Association; June 20–23, 2018; Victoria, British Columbia, Canada.

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