✚ Evidence in focus

POLAR3◊ clinical evidence summary

POLAR3

Total Hip Solution

February 2024

Smith+Nephew

Product summary: POLAR3◊

5 studies reporting on POLAR3

Access the POLAR3 clinical evidence summary by clicking or scanning the QR code:

POLAR3 delivers excellent short- to mid-term survivorship

One of the highest survivorship rates of any cementless hip combination[1]

NJR (annual report)[1]
98.1%
POLARSTEM◊/R3◊

Compared to the NICE benchmark (5%), the revision rate of 1.9% equates to a 62% lower risk of revision at 10 years[1,2]

0 years — 6 years — 10 years — 11 years

Alva A, et al*[3]
99.5% (stem)
99.8% (cup)
POLAR3

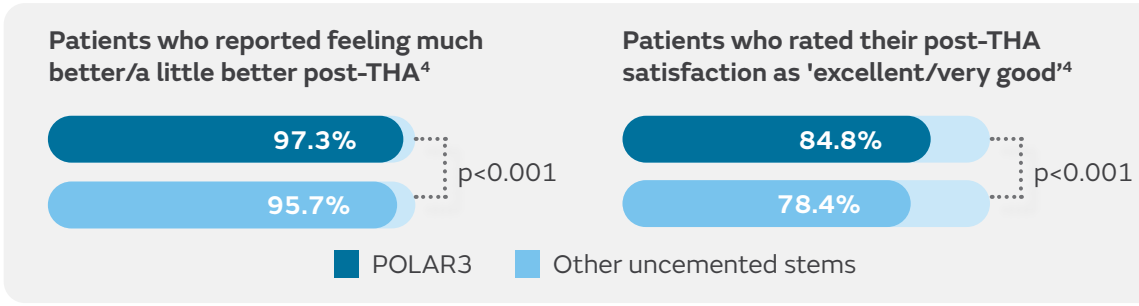
NJR (implant summary report)[4]
97.8%
POLAR3

POLAR3 is associated with strong clinical, functional and radiological outcomes

- Lower revision risk due to aseptic loosening of either stem or cup[4]
- Low postoperative complication rate when used in bikini incision DAA THA[3]
- Strong medium-term functional and radiographic outcomes in younger patients[5]

POLAR3 results in excellent PROMs and better than class average patient satisfaction

POLAR3 results in significantly improved average 6-month OHS, EQ-5D and EQ-VAS scores compared with other uncemented stems (p<0.001),[4] and improvements from pre- to postoperative HHS[3]



*This study included 865 cases of bikini incision DAA THA using POLARSTEM/CPCS◊ stem with R3 and OXINIUM◊.

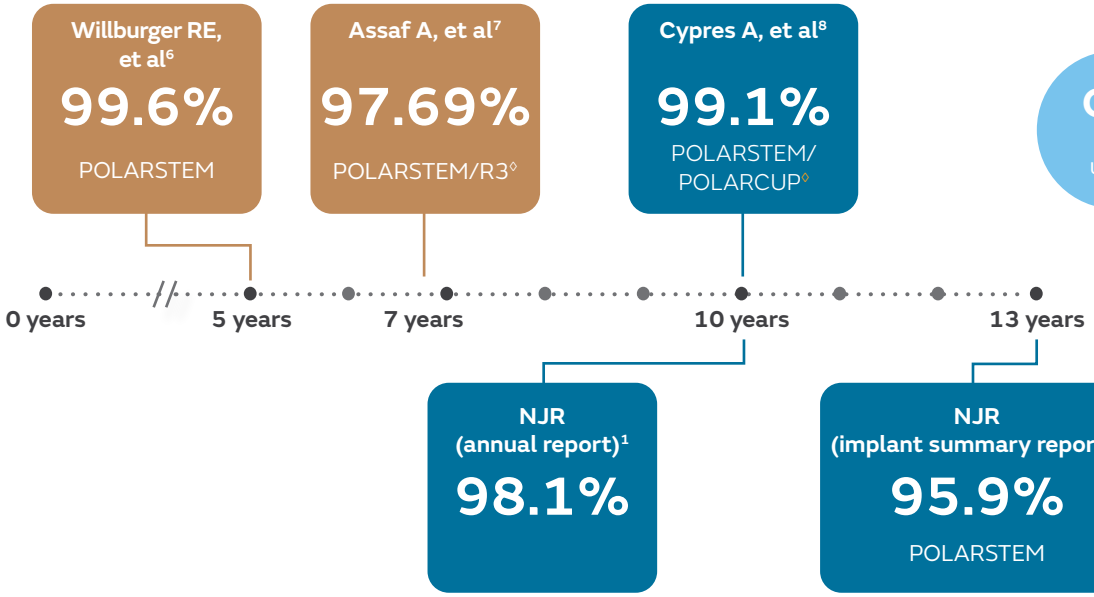
Abbreviations: CPCS = collarless polished cemented stem; DAA = direct anterior approach; EQ-5D = EuroQol-5 Dimensions; EQ-VAS = EuroQol Visual Analogue Scale; HHS = Harris Hip Score; NICE = National Institute for Health and Care Excellence; NJR = National Joint Registry; OHS = Oxford Hip Score; PROMs = patient reported outcome measures; THA = total hip arthroplasty.

Product summary: POLARSTEM◊

9 studies reporting on POLARSTEM

Access the POLAR3 clinical evidence summary by clicking or scanning the QR code:

POLARSTEM delivers excellent short- to mid-term survivorship



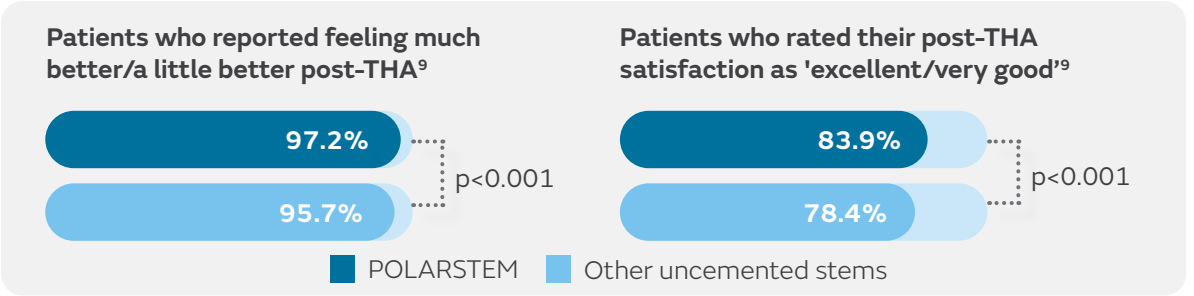
ODEP 10A*
POLARSTEM uncemented stem[10]

POLARSTEM demonstrates excellent clinical outcomes

- Low rates of intraoperative complications[6,8,11]
- Strong radiographic outcomes[8]
- Low blood transfusion rates[11]

POLARSTEM results in improved PROMs and patient satisfaction

POLARSTEM results in significantly improved average 6-month OHS, EQ-5D and EQ-VAS scores compared with other uncemented stems (p<0.001),[9] and improvements from pre- to postoperative HHS and WOMAC scores[6,8]



*A pre-entry benchmark introduced for implants being introduced through beyond compliance.

Abbreviations: EQ-5D = EuroQol-5 Dimensions; EQ-VAS = EuroQol Visual Analogue Scale; HHS = Harris Hip Score; NJR = National Joint Registry; OHS = Oxford Hip Score; PROMs = patient reported outcome measures; THA = total hip arthroplasty; WOMAC = Western Ontario and McMaster Universities Osteoarthritis Index.

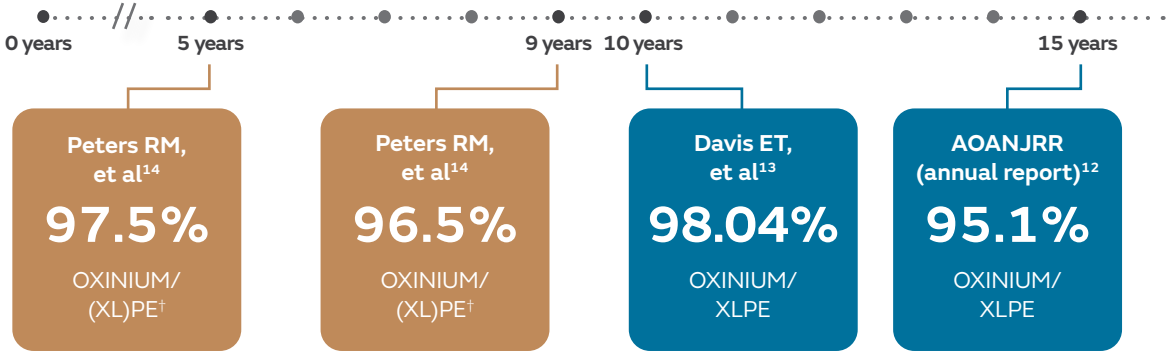
Product summary: OXINIUM®/XLPE

6 studies reporting on OXINIUM/XPLE

Access the POLAR3 clinical evidence summary by clicking or scanning the QR code:

OXINIUM/XLPE demonstrates superior mid- to long-term survivorship compared with other bearing combinations

Highest survivorship of all bearing combinations analysed across multiple registries (AOANJRR, NJR, LROI)*[12–14]



OXINIUM/XLPE results in superior clinical and health economic outcomes compared with non-OXINIUM bearings

- Lower mean hospital LoS[15,16]
- Lower 30–day readmission rate[15,16]
- Greater number of patients discharged to home health care[15,16]
- Lower likelihood of blood transfusion[15]

OXINIUM/XLPE is associated with:

- A **38%** lower revision risk from 1 year compared with Metal/XLPE[12]
- A **19%** lower revision risk compared with Metal/PE[14]
- A **60%** lower risk of revision relative to the NICE benchmark at 10 years[2,13]

OXINIUM/XLPE is associated with a significant **$602** reduction in 90–day episode of care costs when compared with non-OXINIUM bearings (p=0.003)[16]

*Period of registry analysis for AOANJRR: 1999–2022; NJR: 2004–2016; LROI: 2007–2016. †OXINIUM/(XL)PE includes grouped data for OXINIUM bearings on XLPE or PE.

Abbreviations: AOANJRR = Australian Orthopaedic Association National Joint Replacement Registry; Metal/PE = metal on polyethylene; Metal/XLPE = metal on crosslinked polyethylene; NICE = National Institute for Health and Care Excellence; NJR = National Joint Registry; OXINIUM/XLPE = ceramicised metal on XLPE; LROI = Landelijke Registratie Orthopedische Implantaten (Dutch Arthroplasty Register).

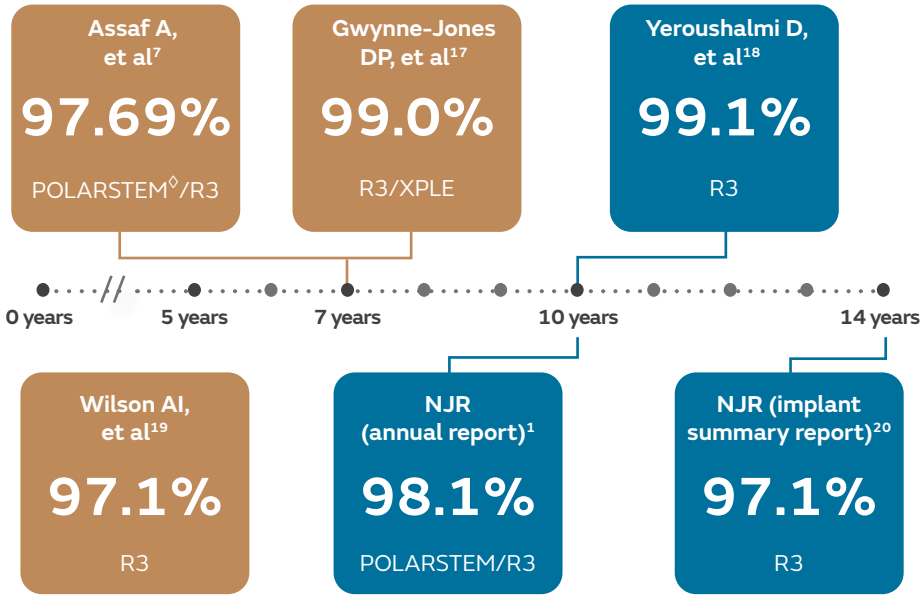
Smith+Nephew

Product summary: R3◊

8 studies reporting on R3

Access the POLAR3 clinical evidence summary by clicking or scanning the QR code:

R3 delivers excellent short- to mid-term survivorship



ODEP 13A*
R3 uncemented cup[10]

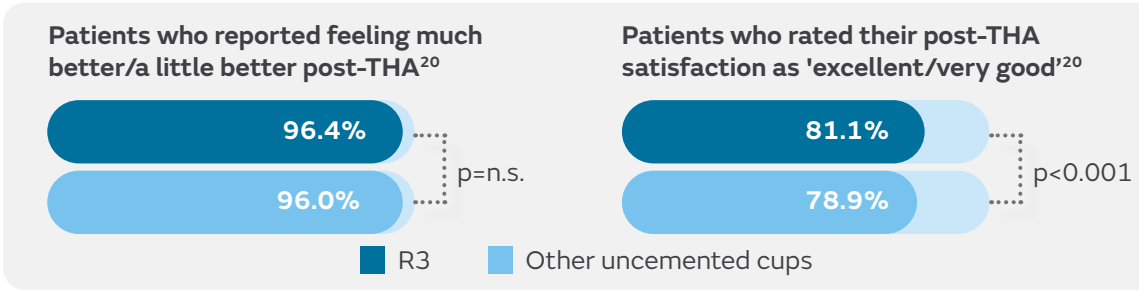
1.4% lower cumulative 14-year revision rate compared with all other uncemented cups[20]

R3 demonstrates excellent clinical outcomes

- Low rates of intraoperative complications[11]
- Low rate of postoperative complications[18]
- Strong radiographic outcomes[21]
- Low liner dissociation rate when compared with Pinnacle[17]

R3 results in improved PROMs and patient satisfaction

R3 results in significantly improved average 6-month OHS, EQ-5D and EQ-VAS scores compared with other uncemented cups (p<0.001),[20] and improvements from pre- to postoperative HHS and WOMAC scores[5,19]



*A pre-entry benchmark introduced for implants being introduced through beyond compliance.

Abbreviations: EQ-5D = EuroQol-5 Dimensions; EQ-VAS = EuroQol Visual Analogue Scale; HHS = Harris Hip Score; NJR = National Joint Registry; n.s. = not significant; OHS = Oxford Hip Score; PROMs = patient reported outcome measures; THA = total hip arthroplasty; WOMAC = Western Ontario and McMaster Universities Osteoarthritis Index.

✚ Evidence in focus

Arthroplasty registry analysis (2023)

Smith+Nephew

POLAR Total Hip Solution delivers high survivorship at 11 years, higher than class average patient satisfaction and improvements in PROMS[4]

Overview

- Bespoke implant report produced by the UK NJR summarising usage and outcomes associated with POLAR3, the combination of POLARSTEM◊, OXINIUM◊ femoral head, highly bearing and R3◊ cup
- The analysis is based on data collected by the NJR and on PROMS data collected by NHS Digital
- Reported POLAR3 usage between July 2007 and September 2023 for:
  - 25,619 THR
  - 23,087 total patients
  - 497 implating surgeons at 104 centres

Considerations

The data used for this analysis was obtained from the NJR Supplier Feedback System. The HQIP and/or the NJR take no responsibility for the accuracy, currency, reliability and correctness of any data used or referred to in this report, nor for the accuracy, currency, reliability and correctness of links or references to other information sources and disclaims all warranties in relation to such data, links and references to the maximum extent permitted by legistlation.

Results

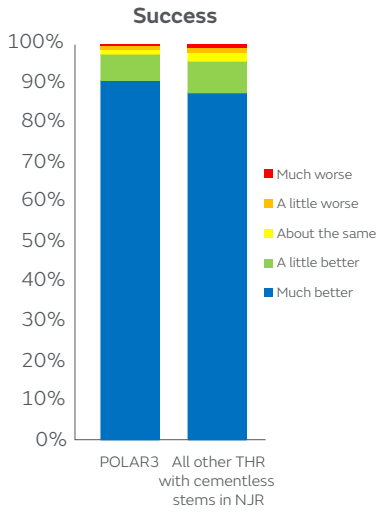
11 years — **97.8%** survivorship with POLAR3

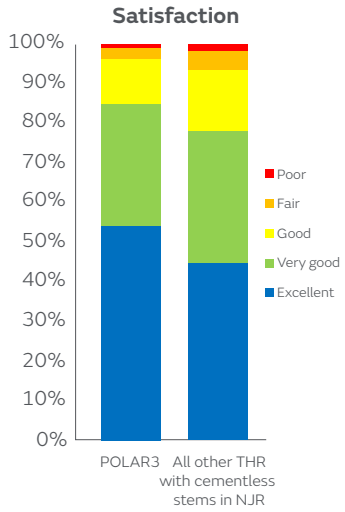
38% ↓ Lower revision risk with POLAR3 compared to class average for all other THR with cementless stems 11 years[4]

ODEP[10]
10A* POLARSTEM Cementless Stem
13A* R3 Cementless Cup

Patients who received POLAR3...

Were **significantly more likely to be satisfied** with their THR and to consider their procedure a success (p<0.001), after 6 months, compared to those who received all other THR with cementless stems





Achieved **significantly better average 6-month PROM scores** compared to patients who received other types of cementless stems (p<0.001)

PROMs	POLAR3	All other THR with NJR cementless stems	p value
Oxford Hip Score	23.1 (22.9–23.3)	21.7 (21.6–21.7)	p<0.001
EQ-5D	0.472 (0.466–0.479)	0.443 (0.442–0.444)	
EQ-VAS	14.7 (14.3–15.2)	12.3 (12.3–12.4)	

Adjusted health gain scores (95% confidence interval) at 6 months after THR. Adjusted scores correspond to the NHS Digital version 3 case-mix-adjustment model. Using case-mix adjusted scores allows for a more accurate comparison between groups by taking into account variations in patient characteristics.

Conclusions

POLAR3 delivers 11-year survivorship of 97.8%. It also delivers significantly higher patient satisfaction, success outcomes and improvements in PROMs compared to the class average for cementless stems in all other THR patients.

*A pre-entry benchmark introduced for implants being introduced through beyond compliance.

Abbreviations: EQ-5D= EuroQol-5 Dimensions; EQ-VAS= EuroQol Visual Analogue Scale; HQIP=Healthcare Quality Improvement Partnership; NJR=national joint registry; ODEP= Orthopaedic Data Evaluation Panel; PROMs=patient reported outcome measures; THR=total hip replacements; XLPE=crosslinked polyethylene.

✚ Evidence in focus

Arthroplasty registry analysis (2023)

Smith+Nephew

Comparison of survivorship of cementless constructs in primary total hip arthroplasty THA

Available at: NJR 20th Annual Report 2023

Overview

- The NJR reported on primary THA between 1 April 2003 and 31 December 2022, with a follow-up at maximum of 19 years
- Cementless THA accounted for 37% of all primary THA (n=1,448,541)
- All cementless THA protheses with at least 10 years follow-up, ≥10,000 procedures and >250 implants at risk included in this analysis

Acknowledgments

We thank the patients and staff of all the hospitals in England, Wales and Northern Ireland who have contributed data to the National Joint Registry. We are grateful to the HQIP, the NJR Steering Committee and staff at the NJR Centre for facilitating this work. The views expressed represent those of the authors and do not necessarily reflect those of the NJR Steering Committee or the HQIP who do not vouch for how the information is presented.

Results

10 years 98.07% survivorship with POLARSTEM◊/R3◊

57% ↓ Lower revision risk with POLARSTEM/R3 compared to class average for cementless hip combinations at 10 years[1]

ODEP[10]
10A* POLARSTEM Cementless Stem
13A* R3 Cementless Cup

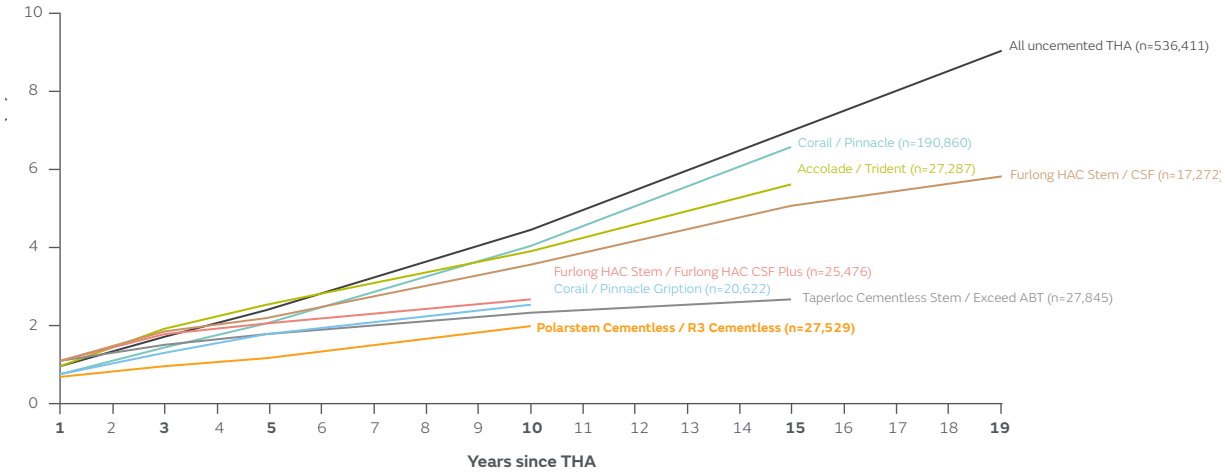


Figure. Cumulative revision of THA prostheses with at least 10 years follow-up, ≥10,000 procedures and >250 implants at risk

Conclusions

POLARSTEM with R3 was associated with a 1.93% revision rate at 10 years. This revision rate corresponds to a 57% reduction in revision risk compared with the class average revision rate for cementless constructs in the NJR.

*A pre-entry benchmark introduced for implants being introduced through beyond compliance.

Abbreviations: HQIP=Healthcare Quality Improvement Partnership; NJR=national joint registry; ODEP= Orthopaedic Data Evaluation Panel; THA=total hip arthroplasty.

✚ Evidence in focus

Arthroplasty registry analysis

Smith+Nephew

Comparison of survivorship of OXINIUM◊/XLPE with other bearing combinations in primary total hip arthroplasty[12]

Available at: AOANJRR Annual Report, 2023

Overview

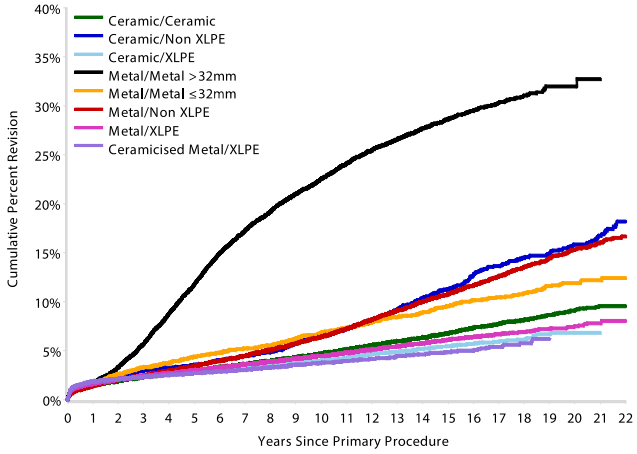
- The AOANJRR reported on 10 bearing surfaces, 8 of which have been used in >5,000 procedures
- Bearing surfaces include three types of femoral head (metal, ceramic, and ceramicised metal [OXINIUM]) and four types of acetabular articular surface (XLPE, non XLPE, ceramic, and metal)

Considerations

Comparing the rates of revision for these bearings, Ceramicised Metal/XLPE* has the lowest rate of revision at 15 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.

Results

15 years 95.1% survivorship



Number at Risk	0 Yr	1 Yr	3 Yrs	5 Yrs	10 Yrs	15 Yrs	20 Yrs
Ceramic/Ceramic	107126	101283	90732	78607	41948	14629	2623
Ceramic/Non XLPE	9962	9108	7463	6050	3541	2150	784
Ceramic/XLPE	143653	122064	86968	56755	15458	3377	286
Metal/Metal >32mm	14424	14063	13216	11981	9306	4165	100
Metal/Metal ≤32mm	5143	5021	4840	4654	3954	2651	787
Metal/Non XLPE	35807	34413	32041	29306	20949	11722	3369
Metal/XLPE	196515	181105	153647	124529	56134	15691	1385
Ceramicised Metal/XLPE	34564	30720	24139	18672	8012	2230	0

OXINIUM/XLPE has the **lowest revision rate** of all modern bearing combinations

HR adjusted for age and gender

Ceramic/Ceramic vs Metal/XLPE	Entire Period: HR=0.99 (0.96, 1.03), p=0.770
Ceramic/Non XLPE vs Metal/XLPE	0 - 2Yr: HR=1.16 (1.01, 1.32), p=0.029 2Yr - 3.5Yr: HR=1.48 (1.15, 1.91), p<0.002 3.5Yr -5Yr: HR=0.85 (0.58, 1.24), p<0.388 5Yr - 8Yr: HR=01.50 (1.18, 1.89), p<0.001 8Yr+: HR=2.67 (2.37, 3.01), p<0.001
Ceramic/XLPE vs Metal/XLPE	0 - 2Yr: HR=1.01 (0.97, 1.06), p=0.562 2Yr+: HR=0.77 (0.72, 0.82), p<0.001
Metal/Metal ≤32mm vs Metal/XLPE	0 - 2Wk: HR=1.27 (0.96, 1.68), p=0.092 2Wk - 1Mth: HR=0.46 (0.31, 0.67), p<0.001 1Mth - 9Mth: HR=0.96 (0.79, 1.15), p=0.636 9Mth - 1.5Yr: HR=2.81 (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 (5.72, 7.29), p<0.001 3Yr - 8Yr: HR=9.45 (8.90, 10.02), p<0.001 8Yr - 10Yr: HR=5.92 (5.28, 6.63), p<0.001 10Yr - 12Yr: HR=4.86 (4.29, 5.51), p<0.001 12Yr+: HR=3.35 (2.97, 3.77), p<0.001
Metal/Non XLPE vs Metal/XLPE	Entire Period: HR=1.42 (1.30, 1.56), p<0.001
Ceramicised Metal/XLPE vs Metal/XLPE	0 - 6Mth: HR=1.16 (1.06, 1.27), p<0.001 6Mth - 1Yr: HR=1.04 (0.85, 1.28), p=0.694 1Yr+: HR=0.62 (0.56, 0.69), p<0.001

30% ↓ From 1 year, OXINIUM/XLPE demonstrates significantly lower risk of revision compared to Metal/XLPE (p<0.001)

Conclusions

OXINIUM/XLPE has the highest survivorship of all bearing combinations up to 19 years.

*The term 'Ceramicised Metal/XLPE' is equivalent to 'OXINIUM/XLPE', and the term 'Non XLPE' is equivalent to 'CPE'.

Abbreviations: AOANJRR=Australian Orthopaedic Association National Joint Replacement Registry; CPE=conventional polyethylene; Metal/XLPE=metal on crosslinked polyethylene; XLPE=crosslinked polyethylene.

✚ Evidence in focus

View the full POLAR3◊ Interactive compendium of clinical evidence by clicking or scanning the QR code:

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