Implant Summary Report for:

Heraeus Medical

Knees using Palacos Antibiotic Cement

Comprising PRIMARY knees implanted up to:	02 July 2025
NJR Database extract:	01 August 2025
Produced on:	09 August 2025
Licensed for use until:	09 August 2026

Contents

This report has been produced by the National Joint Registry (NJR). It summarises usage and outcomes associated with brand(s) Palacos Antibiotic up to the specified dates. Patients aged less than 18 have been excluded. This analysis is based on data collected by the NJR and PROMs data collected by the NHS for the components listed in Appendix A. This report excludes all procedures where major components from mixed manufacturers have been implanted.

This report is made available to Heraeus Medical under licence. Under this licence, Heraeus Medical is free to distribute this document, subject to the restrictions specified in the National Joint Registry Supplier Feedback Terms of Use and Use Code of Practice.

Knees using Palacos Antibiotic Cement

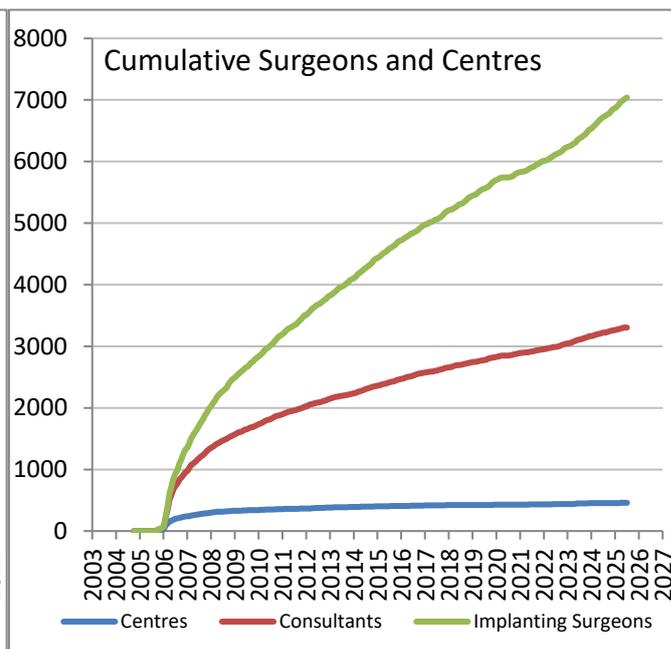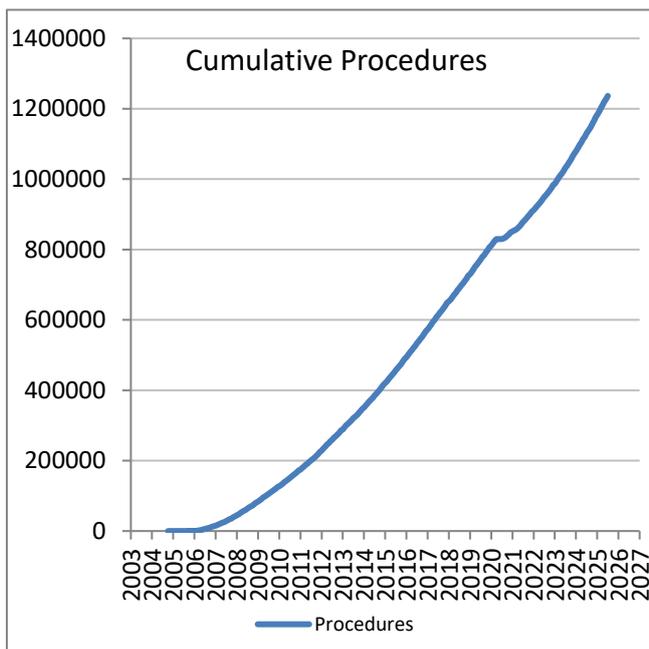## NJR Recorded Usage

Implant Usage

Date of first recorded usage in the NJR: **01 September 2005**

Date of last recorded usage in this dataset **02 July 2025**

Maximum implantation time: 19.8 years

Mean implantation time: 6.9 years

Totals Recorded in NJR	Cumulative Total
Procedures	1,236,923
Patients	1,000,832
Centres	458
Consultants	3,304
Implanting Surgeons	7,042

Current Outcome	Pre-2014	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total	%
Death	1E+05	17458	15972	14299	11905	9267	7684	2563	2557	2036	1191	397	21	228192	18.4%
Revised	16715	2535	2462	2223	2044	1684	1397	619	788	801	651	364	86	32369	2.6%
Unrevised	2E+05	49087	55628	62040	65740	66679	72052	36732	57388	72840	89361	1E+05	54497	976362	78.9%
Total	4E+05	69080	74062	78562	79689	77630	81133	39914	60733	75677	91203	1E+05	54604	1236923	100%

Year of implantation

National Joint Registry
Working for patients, committed to excellence

Patient / Procedure Details

Patient Details

	Knees using Palacos Antibiotic Cement	All other cement brands in NJR
Total Procedures	1,236,923	502,984
Total Patients	1,000,832	427,109
Demographics		
Mean age	**69.6**	**69.8**
< 50	2.2%	2.5%
50 – 59	13.8%	13.2%
60 – 69	33.0%	32.3%
70 – 79	37.3%	37.7%
≥ 80	13.7%	14.3%
Median BMI	**30**	**30**
% BMI information available	74.8%	59.8%
Underweight (BMI < 18.5)	0.2%	0.2%
Normal (18.5 ≤ BMI < 25)	10.3%	11.1%
Overweight (25 ≤ BMI < 30)	34.0%	34.6%
Obese I (30 ≤ BMI < 35)	32.5%	31.4%
Obese II (35 ≤ BMI < 40)	16.6%	16.2%
Obese III (BMI ≥ 40)	6.4%	6.5%
%Female	56.4%	57.1%
%Male	43.6%	42.9%
ASA Grades		
P1 - Fit and healthy	8.5%	11.9%
P2 - Mild disease not incapacitating	72.7%	70.3%
P3 - Incapacitating systemic disease	18.5%	17.4%
P4 / P5	0.3%	0.4%
Indications		
Osteoarthritis	97.72%	97.03%
RheumatoidArthritis	1.14%	1.64%
OtherInflammatoryArthropathy	0.74%	0.72%
PreviousTrauma	0.63%	0.73%
AvascularNecrosis	0.37%	0.39%
Other	0.69%	0.96%

Total of indications may exceed total number of implants, since more than one indication can be listed per case.

National Joint Registry
Working for patients, committed to excellence

Knees using Palacos Antibiotic Cement

Revision and Survivorship

Reasons for Revision

Reasons for revision of primary procedures in which the implant was used.

Reason for Revision	Revised†	Expected Revisions*	Revision Rate Ratio (80% Cred. Int.)	Probability RRR < 1
Infection	7155	7277.13	0.92 - 0.97	0.994
Progressive Arthritis Remaining	5737	5981.84	0.87 - 0.92	> 0.999
Aseptic Loosening Femur	2885	3011.09	0.88 - 0.94	> 0.999
Aseptic Loosening Tibia	5975	5984.47	0.97 - 1.02	0.58
Aseptic Loosening Patella	440	440.92	0.90 - 1.10	0.53
Unexplained Pain	3660	3722.31	0.93 - 0.99	0.95
Stiffness	2004	2022.95	0.93 - 1.02	0.77
Malalignment	2128	2194.55	0.88 - 0.96	0.991
Instability	4700	4803.68	0.92 - 0.97	0.993
Dislocation / Subluxation	1020	1076.87	0.82 - 0.93	0.998
Periprosthetic Fracture	1660	1668.33	0.94 - 1.04	0.63
Wear of Polyethylene Component	1651	1814.35	0.79 - 0.87	> 0.999
Lysis - Tibia	1439	1464.26	0.91 - 1.01	0.85
Lysis - Femur	887	940.94	0.83 - 0.94	0.996
Component Dissociation	358	378.86	0.79 - 0.97	0.95
Implant Fracture	197	201.23	0.83 - 1.09	0.67
Other / Not recorded	1870	1874.94	0.95 - 1.04	0.57
Total Revised	**32366**	**33013.24**	**0.94 - 0.96**	**> 0.999**

† multiple reasons may be listed for one revision procedure * Based on All NJR Knees with Cement, adjusted for Age group, Sex, Implantation year and Indications

LCI > 100% higher than expected	🟥	UCI < 1/2 expected	🟦
LCI > 50% higher than expected	🟧	UCI < 2/3 expected	🟦
LCI > 20% higher than expected	🟨	UCI < 5/6 expected	🟦

Components Revised	Knees using Palacos Antibiotic Cement	All other cement brands in NJR
Femoral only	957	3.0%	3.3%
Tibial only	1580	4.9%	4.7%
Femoral and Tibial	20715	64.0%	71.6%
Bearing exchange only	4780	14.8%	10.3%
Secondary patella resurfacing only	3704	11.4%	8.5%
Patella revision only	304	0.9%	0.8%
Not recorded	329	1.0%	0.8%

National Joint Registry
Working for patients, committed to excellence

Knees using Palacos Antibiotic Cement

Revision and Survivorship

Cumulative Revision Rate

Endpoint: All reasons for revision.

Cox Proportional Hazards model for revision risk ratio of Knees using Palacos Antibiotic Cement / All other cement brands in NJR, with endpoint as any revision.

Adjustment	Hazard Ratio (95% CI)	p-value
Unadjusted.	0.86 ‡ (0.84 - 0.87)	< 0.001
Adjusted for age, sex, ASA, BMI, Op.date and indications.	0.94 ‡ (0.92 - 0.95)	< 0.001

‡ Hazard ratio varies with time

Revision and Survivorship

Cumulative Revision Rate

Endpoint: All revisions

Period /years	At Risk	Knees using Palacos Antibiotic Cement	All other cement brands in NJR
0	1236923	0.00% (0.00% - 0.00%)	0.00% (0.00% - 0.00%)
1	1115021	0.45% (0.44% - 0.46%)	0.48% (0.46% - 0.50%)
2	1000171	0.99% (0.98% - 1.01%)	1.13% (1.10% - 1.16%)
3	899559	1.48% (1.46% - 1.50%)	1.69% (1.65% - 1.73%)
4	812198	1.85% (1.83% - 1.88%)	2.12% (2.08% - 2.16%)
5	745943	2.16% (2.14% - 2.19%)	2.49% (2.45% - 2.54%)
6	671330	2.45% (2.42% - 2.48%)	2.82% (2.77% - 2.87%)
7	578911	2.72% (2.68% - 2.75%)	3.14% (3.08% - 3.19%)
8	492900	2.99% (2.95% - 3.03%)	3.44% (3.38% - 3.49%)
9	408420	3.26% (3.22% - 3.29%)	3.74% (3.68% - 3.80%)
10	331829	3.52% (3.48% - 3.56%)	4.06% (4.00% - 4.12%)
11	263593	3.80% (3.75% - 3.84%)	4.44% (4.37% - 4.51%)
12	205827	4.08% (4.03% - 4.13%)	4.81% (4.74% - 4.89%)
13	155550	4.33% (4.28% - 4.39%)	5.17% (5.10% - 5.25%)
14	111261	4.65% (4.59% - 4.71%)	5.55% (5.46% - 5.63%)
15	77178	5.00% (4.93% - 5.07%)	5.91% (5.82% - 6.00%)
16	49293	5.41% (5.32% - 5.50%)	6.30% (6.20% - 6.40%)
17	26670	5.80% (5.69% - 5.91%)	6.71% (6.60% - 6.82%)
18	10939	6.13% (6.00% - 6.27%)	7.18% (7.06% - 7.30%)
19			7.67% (7.53% - 7.81%)
20			8.07% (7.90% - 8.23%)

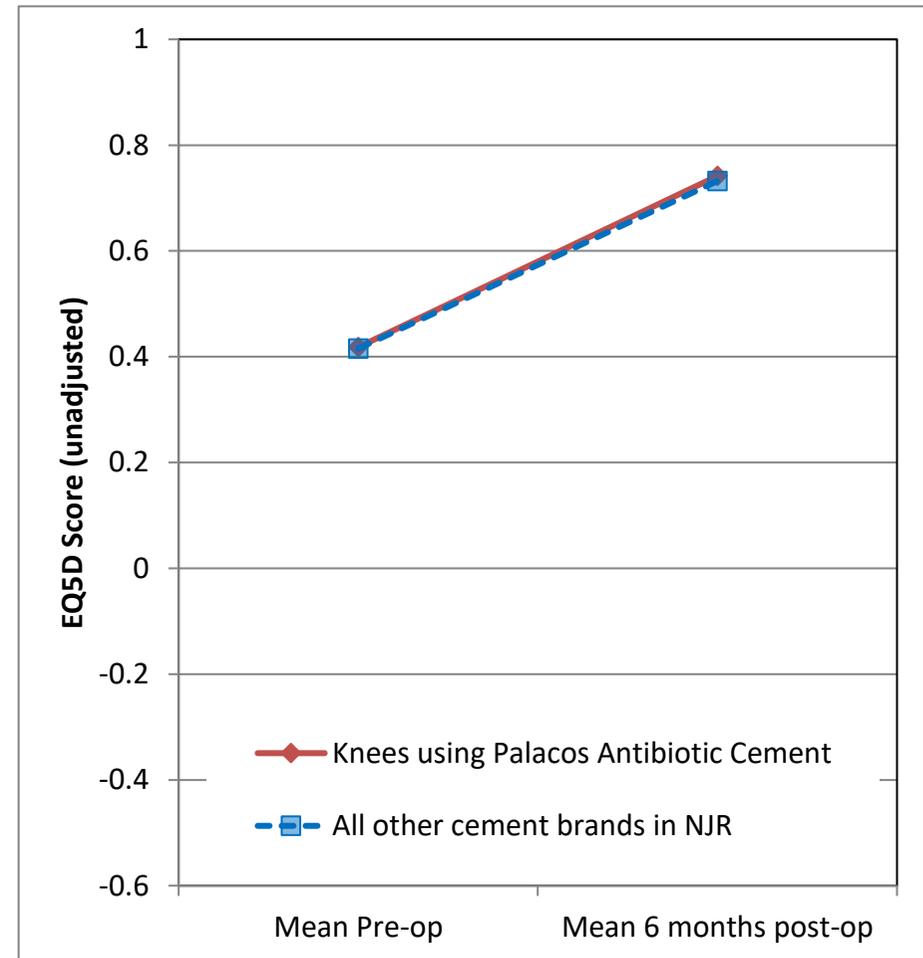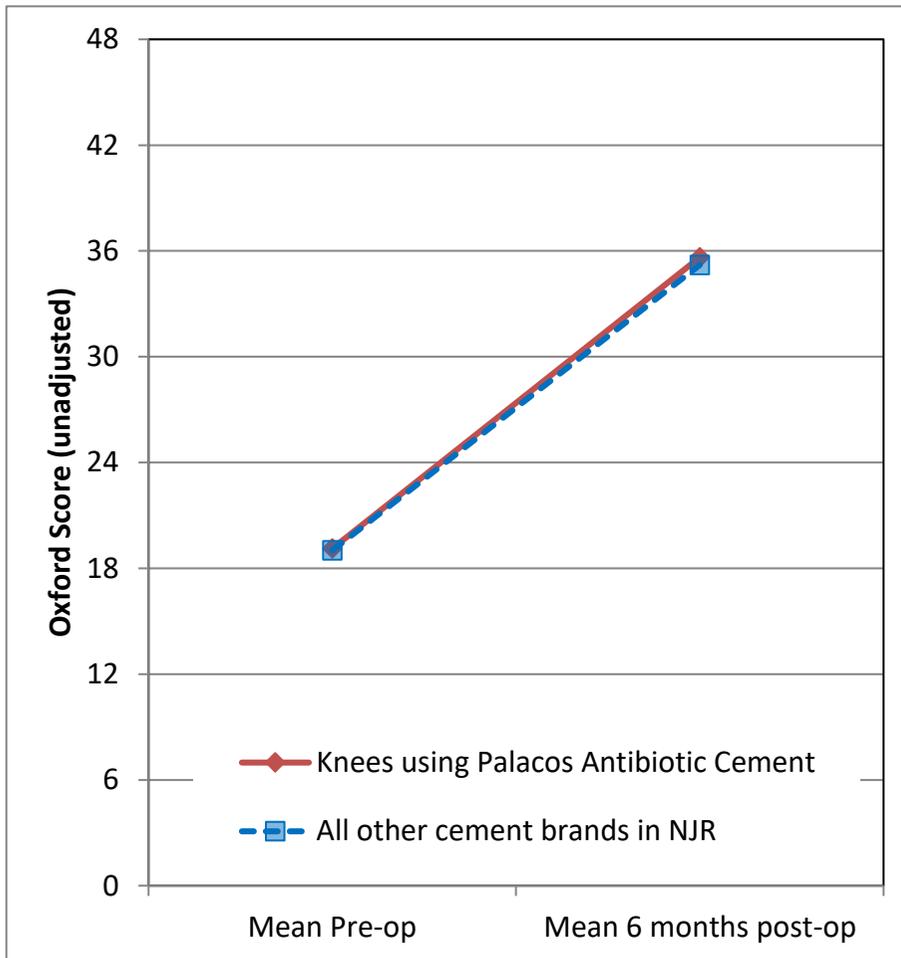Cumulative revision rate with 95% confidence intervals
Rate is only reported for times where 40 or more remain at risk

Knees using Palacos Antibiotic Cement

Patient Reported Outcomes

PROMs Analysis

Comprising PROMs data up to and including: 31/03/2022

National Joint Registry
Working for patients, committed to excellence

Patient Reported Outcomes

PROMs Analysis

Comprising PROMs data up to and including: 31/03/2022

Oxford Knee Score (0 - 48)	Knees using Palacos Antibiotic Cement	All other cement brands in NJR	All knees in NJR
Paired Records	282,425	99,628	400,225
PreOp score	19.1 (19.1 - 19.2)	19.0 (19.0 - 19.1)	19.1 (19.1 - 19.1)
6 month score	35.6 (35.6 - 35.7)	35.2 (35.1 - 35.3)	35.5 (35.5 - 35.6)
6 month score (adjusted)	35.6 (35.6 - 35.6)	35.3 (35.3 - 35.4)	35.5 (35.5 - 35.6)
Health gain	16.5 (16.5 - 16.5)	16.2 (16.1 - 16.2)	16.4 (16.4 - 16.4)
Health gain (adjusted)	16.5 (16.5 - 16.5)	16.2 (16.1 - 16.3)	16.4 (16.4 - 16.5)
p value (adjusted health gain)	<0.001		
Score Improved	94.1%	93.6%	93.9%

EQ-5D Index (-0.59 - 1.00)	Knees using Palacos Antibiotic Cement	All other cement brands in NJR	All knees in NJR
Paired Records	262,336	92,250	371,548
PreOp score	0.418 (0.417 - 0.419)	0.415 (0.413 - 0.417)	0.418 (0.417 - 0.419)
6 month score	0.742 (0.741 - 0.743)	0.732 (0.730 - 0.734)	0.739 (0.738 - 0.740)
6 month score (adjusted)	0.741 (0.740 - 0.742)	0.735 (0.733 - 0.736)	0.739 (0.738 - 0.740)
Health gain	0.324 (0.323 - 0.324)	0.317 (0.315 - 0.318)	0.322 (0.321 - 0.322)
Health gain (adjusted)	0.323 (0.322 - 0.324)	0.317 (0.315 - 0.319)	0.322 (0.320 - 0.323)
p value (adjusted health gain)	<0.001		
Score Improved	81.6%	80.8%	81.4%

EQ-VAS (0 - 100)	Knees using Palacos Antibiotic Cement	All other cement brands in NJR	All knees in NJR
Paired Records	250,800	88,747	355,975
PreOp score	67.9 (67.8 - 68.0)	67.9 (67.8 - 68.1)	67.9 (67.9 - 68.0)
6 month score	74.3 (74.2 - 74.4)	73.6 (73.5 - 73.7)	74.1 (74.1 - 74.2)
6 month score (adjusted)	74.3 (74.2 - 74.3)	73.7 (73.6 - 73.9)	74.1 (74.1 - 74.2)
Health gain	6.4 (6.3 - 6.5)	5.6 (5.5 - 5.8)	6.2 (6.2 - 6.3)
Health gain (adjusted)	6.3 (6.3 - 6.4)	5.8 (5.7 - 6.0)	6.2 (6.1 - 6.3)
p value (adjusted health gain)	<0.001		
Score Improved	57.0%	55.2%	56.5%

Adjusted scores correspond to the NHS England version 3 casemix-adjustment model. This includes patient variables from PROMs, HES, and IMD data.

Figures in parentheses represent the 95% confidence interval for the mean

National Joint Registry
Working for patients, committed to excellence

Knees using Palacos Antibiotic Cement

Responses are not case mix adjusted

Patient Reported Outcomes

Success

Legend:
- Much worse (red)
- A little worse (orange)
- About the same (yellow)
- A little better (green)
- Much better (blue)

X-axis categories: Knees using Palacos Antibiotic Cement; All other cement brands in NJR

Chi Squared p-value for difference: <0.001

Answer to 6-months general health question: Overall, how are your problems now, compared to before your operation?

Satisfaction

Legend:
- Poor (red)
- Fair (orange)
- Good (yellow)
- Very Good (green)
- Excellent (blue)

X-axis categories: Knees using Palacos Antibiotic Cement; All other cement brands in NJR

Chi Squared p-value for difference: <0.001

Answer to 6-months general health question: How would you describe the results of your operation?

National Joint Registry
Working for patients, committed to excellence

Knees using Palacos Antibiotic Cement

Patient Reported Outcomes

Success

Response	Knees using Palacos Antibiotic Cement	All other cement brands in NJR
Much better	216004	76071
A little better	46097	16744
About the same	12959	4709
A little worse	9679	3752
Much worse	6397	2485

Answer to 6-months general health question:

"Overall, how are your problems now, compared to before your operation?"

Satisfaction

Response	Knees using Palacos Antibiotic Cement	All other cement brands in NJR
Excellent	76134	26891
Very Good	104278	36688
Good	69553	24965
Fair	31387	11426
Poor	9227	3535

Answer to 6-months general health question:

"How would you describe the results of your operation?"

National Joint Registry
Working for patients, committed to excellence

Disclaimer

Disclaimer

The data used for this analysis was obtained from the National Joint Registry ("NJR"), part of the Healthcare Quality Improvement Partnership ("HQIP"). HQIP, the NJR and/or its contractor, NEC Software Solutions (UK) Limited ("NEC") take no responsibility (except as prohibited by law) 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 legislation including any duty of care to third party readers of the data analysis.

To the maximum extent permitted by law, neither the NJR or NEC shall have any liability (including but not limited to liability by reason of negligence) for any loss, damage, cost or expense incurred or arising by reason of any person using or relying on the data within this report and whether caused by reason of any error, omission or misrepresentation in the report or otherwise. This report is not to be taken as advice. Third parties using or relying on the data in this report do so at their own risk and will be responsible for making their own assessment and should verify all relevant representations, statements and information with their own professional advisers.

Appendix A: Component List

Catalogue Number	Description	Number Implanted
Cement		
5081280	PALACOS® R+G PRO 80 CE EUR	42
66017569	PALACOS R +G 2x40 g	1011546
66017771	PALACOS R +G 1x40 g	26222
66017772	PALACOS R +G 1x60 g	49164
66017773	PALACOS R +G 2x20 g	42327
66017776	PALACOS R +G 2x10 g	34
66017787	PALACOS LV +G 1x40 g	1892
66031993	PALACOS MV+G 1x40g	562
66031995	PALACOS MV+G 2x40 g	4883
66031996	PALACOS MV+G 1x20g	9
66031998	PALACOS MV+G 2x20 g	38
66032000	PALACOS MV+G 1x60 g	1
66037894	PALACOS LV+G 1x20g	2
66044274	PALACOS R+G Pro 75 cement	13
Multiple Found	Multiple Found	100188