NOCA National Office of Clinical Audit

INOR Irish National Orthopaedic Register | IITOS THE IRISH INSTITUTE OF TRAUMA AND ORTHOPAEDIC SURGERY

IRISH NATIONAL ORTHOPAEDIC REGISTER

NATIONAL REPORT 2015-2024

APPENDICES

APPENDIX 1: HOSPITALS AND PEOPLE WE WORK WITH

Hospital	**Local audit coordinator**	**Clinical Lead**
South Infirmary Victoria University Hospital (SIVUH)	Kas Linehan/Noreen Lynch	Mr Shane Guerin
Midland Regional Hospital, Tullamore (MRHT)	Dearbhail Foy Nakita Dsouza	Ms Dorothy Niall
Croom Orthopaedic Hospital, Limerick (COH)	Sinead O'Dwyer Anne-Marie Flanagan	Mr Matthew Nagle
Kilcreene Regional Orthopaedic Hospital (KROH)	Margaret Murphy	Mr Terence Murphy
Our Ladys Hospital, Navan (OLHN)	Lisa Donnelly	Mr Aaron Glynn
Merlin Park University Hospital (MPUH)	Catriona Flaherty	Mr Colin Murphy
National Orthopaedic Hospital Cappagh (NOHC)	Shaly Chungath/Jacinta Shields/Patricia White	Mr Paddy Kenny/Mr James Cashman
Kerry University Hospital (UHK)	Patricia O'Sullivan/ Sinead Healy	Ms Eimear Conroy
Blackrock Clinic Dublin (BRC)	Melanie Mc Donald/ Joanne White/Alyshia Harte	Mr Fintan Doyle
Tallaght University Hospital (TUH)	Rachel Chambers/Louise Power	Prof John Quinlan
Bons Secours Hospital Tralee (BSHT)	Rosalie Stack/Sophie Houlihan	
Bons Secours Hospital Galway (BSHG)	Alma Mc Loughlin	Prof Stephen Kearns
Bons Secours Hospital Dublin (BHSD)	Aoife Walsh	Mr Paddy Kenny
Bons Secours Hospital Cork (BSHC)	Joriza Carreon/ Siobhan o Neil	Mr Shane Guerin
Bons Secours Hospital Limerick (BSHL)	Liam Walsh	Prof Eric Masterson
Letterkenny University Hospital (LUH)	Margaret Walsh	Mr Joseph Thomas
Sligo University Hospital (SUH)	Aine Duffy	Mr John Kelly
Mayo University Hospital (MUH)	Ciara Griffin	Paul O Grady

APPENDIX 1.1: ACKNOWLEDGEMENTS

The INOR Governance Committee would like to thank all those who were involved in the early stages of development of INOR and all those who continue to be involved in the implementation phase of the Register. These include but are not limited to:

- HSE Acute Hospitals Division
- HSE National Quality Improvement Team and management
- Project sponsors from the HSE Office of the Chief Information Officer (OcCIO) on behalf of the HSE
- Project managers from the OoCIO, past and present
- All participating hospitals (management, clinical leads and audit coordinators)
- NOCA executive manager, both past a present
- OpenApp team and management (INOR's system development partner)
- NOCA Information Manager
- NOCA executive management team, both past and present
- NOCA analytical team
- Healthcare Pricing Office
- Irish Institute of Trauma and Orthopaedic Surgery
- National Clinical Programme in Trauma and Orthopaedic Surgery
- INOR patients who participate and provide their information to the Register.

APPENDIX 2: INCLUSION AND EXCLUSION CRITERIA

Inclusion and exclusion criteria for the Irish National Orthopaedic Register

All elective hip and knee joint replacement surgery and revisions that are carried out in participating public and private hospitals. It also includes the following:

The revision of Total Hip Replacement (THR) and Total Knee replacement (TKR) following peri-prosthetic fracture where a revision of arthroplasty procedure takes place, e.g. arthroplasty components, are revised.

Table 1: Inclusion and exclusion criteria or INOR

Hip operations included in INOR	
Procedures	**Definition**
Primary total hip arthroplasty	Total joint arthroplasty - i.e. replacement of the femoral head with a stemmed femoral component and the insertion of an acetabular cup (with or without cement).
Primary total hip resurfacing	Hip resurfacing – resurfacing of the femoral head with surface replacement femoral component and insertion of a resurfacing cup.
Single stage revision of - Total hip arthroplasty - Hip resurfacing	The removal and replacement of one or all components in one surgery. The implantation of a Posterior Lip Augmentation Device (PLAD) should be recorded as a single stage revision irrespective of whether any implants have been replaced.
First stage of two-stage revision of - Total hip arthroplasty - Hip resurfacing	The removal of arthroplasty components in preparation for a second planned surgery.
Second stage of two-stage revision of - Total hip arthroplasty - Hip resurfacing	The definitive reimplantation of all arthroplasty components.
Excision arthroplasty	Complete removal of arthroplasty components and arthrodesis of the hip.

Revision THR for a Periprosthetic Fracture	When a periprosthetic fracture occurs and revision surgery is required, only the new arthroplasty components should be captured within INOR.
Hip operations excluded from INOR	
Surgery for traumatic neck of femur fractures.	This is inclusive of all types of neck of femur fractures. Hemiarthroplasty, bipolar hemiarthroplasty and fixation devices using nails/plates and screws.
Reoperation without arthroplasty component removal	This is inclusive of all procedures when **arthroplasty components are not exchanged** including debridement antibiotics implant retention (DAIR) procedure.
Fixation for periprosthetic fracture around a total hip replacement with no revision of arthroplasty components	This is inclusive of any fixation devices ie plates, screw or cables.

Knee Operations included/excluded in INOR	
Procedures	**Definition**
Primary total knee arthroplasty	Total knee arthroplasty - i.e. replacement of both tibial and both femoral condyles with or without resurfacing of the patella (with cement / without cement).
Primary unicondylar knee arthroplasty	Unicondylar arthroplasty - i.e. replacement of one compartment of the knee with or without resurfacing of the patella.
Primary patellofemoral arthroplasty	A type of partial knee replacement in which only a portion of the knee is resurfaced.
Single stage revision - Total knee arthroplasty - Unicondylar knee - Patellofemoral arthroplasty	The removal and replacement of all components in one surgery.

First stage of two-stage revision of: - - Total knee arthroplasty - Unicondylar knee - Patellofemoral arthroplasty	The removal of arthroplasty components in preparation for a second planned surgery which will replace all components.
Second stage of two-stage revision	The definitive reimplantation of all arthroplasty components.
Excision arthroplasty	Complete removal of arthroplasty components and arthrodesis of the knee.
Revision total knee arthroplasty for periprosthetic fracture	When a periprosthetic fracture occurs and revision surgery is required only the new arthroplasty components should be captured within INOR.
Knee operations excluded from INOR	
Reoperation other than revision	Any operation where no components are removed or implanted
Fracture fixation for periprosthetic fracture around a TKR – No revision of arthroplasty components	A fracture that occurs around a joint replacement and the operation is to fix the fracture.

APPENDIX 3: INOR GOVERNANCE COMMITTEE

Name	Title
Ms Ruth Kiely	Chairperson of INOR Governance Committee Orthopaedics and Trauma Clinical Programme Manager
Mr John Quinlan	Clinical Lead of INOR Governance Committee Consultant Orthopaedic Surgeon
Mr Maurice Neligan	Representing the private hospitals Consultant Orthopaedic Surgeon
Mr Denis Collins	Consultant Orthopaedic Surgeon Trauma and Orthopaedics
Mr Matthew Nagle	Consultant Orthopaedic Surgeon Trauma and Orthopaedics
Mr Eoghan Pomeroy	Consultant Orthopaedic Surgeon Trauma and Orthopaedics
Pamela Hickey	Programme Manager Trauma and Surgery NOCA
Daragh Browne	Assistant Programme Manager Trauma and Surgery NOCA
Louise Brent	Head of Audit Management NOCA
Dearbhail Foy	Arthroplasty Nurse Specialist at Midlands Regional Hospital Tullamore
Eileen Long	Irish Society of Chartered Physiotherapy
Rosemary Masterson	Nurse Tutor at National Orthopaedic Hospital Cappagh
Tommy Morris	Patient Representative
Tara Regan	Head of Communications and Advocacy, Arthritis Ireland Public Representative
Awaiting nomination	Office of Nursing and Midwifery

APPENDIX 4: INOR GOVERNANCE COMMITTEE MEETING ATTENDANCE

Irish National Orthopaedic Register Governance Committee Attendance in 2025					
Representing	**Name**	**24.02.25**	**26.05.25**	**29.09.25**	**24.11.25**
Head of Audit Management NOCA	Louise Brent	✓	✓	✓	✓
Assistant Programme Manager Trauma and Surgery	Daragh Browne	✓	✓	✓	✓
Orthopaedic Surgeon	Mr Denis Collins	✓	x	✓	x
INOR Audit Coordinator	Dearbhail Foy	✓	✓	✓	✓
Audit Programme Manager Trauma and Surgery	Pamela Hickey	n/a	n/a	✓	x
Chair/National Clinical Programme for Trauma & Orthopaedic Surgery	Ruth Kiely	x	x	✓	✓
Health and Social Care Professions	Eileen Long	n/a	n/a	✓	x
Nurse Educator/Orthopaedics	Rosemary Masterson	✓	✓	✓	x
Patient and Public Interest	Thomas Morris	x	x	x	x
Orthopaedic Surgeon	Mr Matthew Nagle	✓	✓	✓	✓
Independent Hospitals Association of Ireland	Mr Maurice Neligan	✓	✓	✓	x
Orthopaedic Surgeon	Mr Padhraig O'Loughlin	x	x	x	x
Orthopaedic Surgeon	Mr Eoghan Pomeroy	✓	✓	x	x
INOR National Clinical Lead	Mr John Quinlan	✓	✓	✓	✓
Patient and Public Interest	Tara Regan	✓	✓	✓	✓
Programme Manager Trauma and Surgery	Dr Mary Walsh (PhD)	n/a	n/a	x	x
NOCA EMT in attendance only	Brid Moran	✓	✓	✓	✓

APPENDIX 5: SUPPLEMENTARY TABLES

Table 3.1A INOR TOTAL ACTIVITY BY YEAR 2015 - 2024

Year	n
2015	841
2016	851
2017	1013
2018	1920
2019	4144
2020	3884
2021	4729
2022	6103
2023	9540
2024	10266
Total	**43291**

Table 4.1 ARTHROPLASTY BY LATERALITY GROUP

		Laterality group		
site	Type	Bilateral	Unilateral	Total
Hip	Primary	548	21701	22249
	Revision	*	1864	1864
Knee	Primary	552	17550	18102
	Revision	~	*	1076
	Total	***1102***	***42189***	***43291***

~ Denotes five cases or fewer

** Further suppression required to prevent disclosure of five cases or fewer*

Table 4.1A ARTHROPLASTY BY YEAR BY SITE BY TYPE

Site	Type	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
Hip	Primary	382	392	527	1021	2181	2003	2457	3201	4870	5215	22249
	Revision	31	47	57	135	200	193	243	273	370	315	1864
Knee	Primary	411	371	401	709	1660	1581	1905	2479	4083	4502	18102
	Revision	17	41	28	55	103	107	124	150	217	234	1076
Total		**841**	**851**	**1013**	**1920**	**4144**	**3884**	**4729**	**6103**	**9540**	**10266**	**43291**

TABLE 4.2A AGE GROUP BY ARTHROPLASTY SITE AND TYPE

		Age Group																
		<30		30-39		40-49		50-59		60-69		70-79		80-89		90+		Total
Site	Type	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	N
Hip	Primary	*	0%	181	1%	931	4%	3050	14%	5831	26%	7460	34%	4135	19%	601	3%	22249
	Revision	~	0%	*	0%	*	3%	182	10%	344	18%	681	37%	510	27%	92	5%	1864
Knee	Primary	~	0%	13	0%	198	1%	1738	10%	5209	29%	7296	40%	3348	18%	297	2%	18102
	Revision	~	0%	~	0%	~	0%	103	10%	287	27%	443	41%	214	20%	23	2%	1076
Total		***63***	0%	***204***	0%	***1180***	3%	***5073***	12%	***11671***	27%	***15880***	37%	***8207***	19%	***1013***	2%	***43291***

~ Denotes five cases or fewer

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TABLE 4.2.1A AGE (MEAN, MEDIAN) OVER TIME AND NUMBER OF PROCEDURES (N= 23491)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Number of procedures	841	851	1013	1920	4144	3884	4729	6103	9540	10266
Mean Age (years)	76	75	74	74	73	71	71	70	70	69
Median Age (years)	77	76	76	75	74	72	71	71	71	70

TABLE 4.3A SURGERY TYPE BY SEX

		FEMALE		MALE		Total
Site	Procedure Type	n	%	n	%	N
Hip	Primary	11,261	51%	10,988	49%	22,249
	Revision	879	47%	985	53%	1,864
Knee	Primary	10,252	57%	7,850	43%	18,102
	Revision	573	53%	503	47%	1,076

TABLE4.4A BODY MASS INDEX AND SURGERY TYPE

		BMI GROUP kg/m^2													
		0.0-24.9		25.0-29.9		30.0-34.9		35.0-39.9		≥40.0		NULL		Total	
Site	Type	n	%	n	%	n	%	n	%	n	%	n	%	N	%
Hip	Primary	4462	20%	8398	38%	6027	27%	2395	11%	930	4%	37	0.20%	22249	100%
	Revision	413	22%	705	38%	478	26%	195	10%	67	4%	*	0.30%	1864	100%
	Total	***4875***	***20%***	***9103***	***38%***	***6505***	***27%***	***2590***	***11%***	***997***	***4%***	***43***	***0.20%***	***24113***	***100%***
Knee	Primary	1715	9%	5629	31%	5949	33%	3283	18%	1489	8%	37	0.20%	18102	100%
	Revision	105	10%	353	33%	348	32%	190	18%	*	7%	~	0.30%	1076	100%
	Total	***1820***	***9%***	***5982***	***31%***	***6297***	***33%***	***3473***	***18%***	***1566***	***8%***	***40***	***0.20%***	***19178***	***100%***
Total	Primary	6177	15%	14027	35%	11976	30%	5678	14%	2419	6%	74	0.20%	40351	100%
	Revision	518	18%	1058	36%	826	28%	385	13%	144	5%	9	0.30%	2940	100%
	Total	***6695***	***15%***	***15085***	***35%***	***12802***	***30%***	***6063***	***14%***	***2563***	***6%***	***83***	***0.20%***	***43291***	***100%***

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TABLE4.4.1A BODY MASS INDEX GROUP OVER TIME

	2015		2016		2017		2018		2019		2020		2021		2022		2023		2024		Total
BMI Group	**n**	***%***	**n**	***%***	**n**	***%***	**n**	***%***	**n**	***%***	**n**	***%***	**n**	***%***	**n**	***%***	**n**	***%***	**n**	***%***	**N**
0-24.99	142	*17*	133	*16*	173	*17*	313	*16*	594	*14*	553	*14*	735	*16*	944	*15*	1,535	*16*	1,573	*15*	6,695
25.00-29.99	305	*36*	326	*38*	355	*35*	699	*36*	1,336	*32*	1,243	*32*	1,701	*36*	2,149	*35*	3,362	*35*	3,609	*35*	15,085
30.00-34.99	224	*27*	248	*29*	288	*28*	543	*28*	1,305	*31*	1,289	*33*	1,373	*29*	1,770	*29*	2,775	*29*	2,987	*29*	12,802
35.00-39.99	105	*12*	100	*12*	144	*14*	250	*13*	641	*15*	575	*15*	636	*13*	889	*15*	1,311	*14*	1,412	*14*	6,063
>=40	65	*8*	43	*5*	53	*5*	115	*6*	264	*6*	224	*6*	276	*6*	340	*6*	540	*6*	643	*6*	2,563
Total	**841**		**850**		**1013**		**1920**		**4140**		**3884**		**4721**		**6092**		**9523**		**10224**		**43208**

excludes 83 cases that are missing data required to calculate BMI

TABLE 4.5A ASA GRADE BY SURGERY TYPE (N= 43291)

		ASA Grade												
		ASA 1		ASA 2		ASA 3		ASA 4		ASA 5		Unknown		Total
Site	**Procedure Type**	**n**		**n**		**n**		**n**		**n**		**n**		
Hip	Primary	2315	10%	15556	70%	4314	19%	64	0.30%		0%		0%	22249
	Revision	89	5%	1137	61%	620	33%	18	1.00%		0%		0%	1864
	Hips Total	*2404*	10%	*16693*	69%	*4934*	20%	*82*	0.30%		0%		0%	*24113*
Knee	Primary	1156	6%	13188	73%	3728	21%	*	0.20%	~	0%	~	0%	18102
	Revision	54	5%	690	64%	319	30%	13	1.20%		0%		0%	1076
	Knees Total	*1210*	6%	*13878*	72%	*4047*	21%	*	0.20%	~	0%	~	0%	*19178*
	Total	***3614***	8%	***30571***	71%	***8981***	21%	***123***	0.30%	**~**	0%	**~**	0%	***43291***

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TABLE 4.6 COMORBIDITIES BY CATEGORY

Site	Type	Comorbidity Category	n	%
Hip	Primary	Cardiac	11735	53%
		Cerebrovascular	853	4%
		Endocrine	4095	18%
		Haematological	860	4%
		Immunosuppressive condition	460	2%
		Neuromuscular	793	4%
		Renal	674	3%
		Respiratory	3072	14%
		Vascular	746	3%
	Revision	Cardiac	1160	62%
		Cerebrovascular	106	6%
		Endocrine	384	21%
		Haematological	138	7%
		Immunosuppressive condition	61	3%
		Neuromuscular	84	5%
		Renal	83	4%
		Respiratory	261	14%
		Vascular	95	5%
Knee	Primary	Cardiac	11051	61%
		Cerebrovascular	725	4%
		Endocrine	3984	22%
		Haematological	767	4%
		Immunosuppressive condition	399	2%
		Neuromuscular	615	3%

		Renal	569	3%
		Respiratory	2879	16%
		Vascular	627	3%
	Revision	Cardiac	693	64%
		Cerebrovascular	76	7%
		Endocrine	274	25%
		Haematological	62	6%
		Immunosuppressive condition	34	3%
		Neuromuscular	48	4%
		Renal	45	4%
		Respiratory	173	16%
		Vascular	53	5%

TABLE 4.6A NUMBER OF COMORBIDITIES BY SURGERY TYPE (N=43291)

Number of Comorbidities																
		None		1		2		3		4		5+		Unknown		Total
Site	Procedure Type	n	%	n	%	n	%	n	%	n	%	n	%	n	%	N
Hip	Primary	6982	31%	9109	41%	4564	21%	1292	6%	229	1.00%	47	0.20%	26	0.10%	**22249**
	Revision	410	22%	792	42%	451	24%	162	9%	34	1.80%	*	0.50%	~	0.30%	**1864**
Knee	Primary	4330	24%	7761	43%	4428	24%	1287	7%	238	1.30%	35	0.20%	23	0.10%	**18102**
	Revision	204	19%	442	41%	293	27%	105	10%	21	2.00%	*	0.60%	~	0.50%	**1076**

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TABLE 4.6.1A REASONS FOR WITHDRAWAL PRIOR TO SURGERY

	Reasons for withdrawal												
Year of withdrawal	Death		Other		Post anaesthetic review		Voluntary withdrawal		Voluntary withdrawal, Other		Total Withdrawn		Count of all Procedures
2015	~	0.0%	7	0.8%	6	0.7%	~	0.2%	~	0.0%	15	1.8%	841
2016	~	0.0%	38	4.5%	15	1.8%	~	0.2%	~	0.0%	55	6.5%	851
2017	~	0.0%	28	2.8%	9	0.9%	~	0.5%	~	0.0%	42	4.1%	1013
2018	~	0.0%	41	2.1%	15	0.8%	*	0.6%	~	0.0%	68	3.5%	1920
2019	~	0.0%	73	1.8%	39	0.9%	22	0.5%	~	0.0%	134	3.2%	4144
2020	~	0.0%	188	4.8%	25	0.6%	24	0.6%	~	0.0%	237	6.1%	3884
2021	~	0.0%	136	2.9%	38	0.8%	16	0.3%	~	0.0%	190	4.0%	4729
2022	~	0.0%	207	3.4%	4~	0.7%	27	0.4%	~	0.0%	274	4.5%	6103
2023	~	0.0%	288	3.0%	57	0.6%	41	0.4%	~	0.0%	388	4.1%	9540
2024	~	0.0%	338	3.3%	65	0.6%	54	0.5%	~	0.0%	458	4.5%	10266
Total	*		*1344*		*309*		*205*		*		*1861*	*4.3%*	*43291*

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TABLE 4.6.2A INTERVAL BETWEEN PREOPERATIVE ASSESSMENT AND SURGERY

		Interval														
		invalid		within 6 weeks		6- 12 weeks		3-6 months		6-12 months		1-2 years		2+ years		Total
Site	Procedure Type	n		n		n		n		n		n		n		N
Hip	Primary	4	0.00%	13272	60%	4665	21%	3227	15%	930	4%	130	1%	21	0.10%	**22249**
	Revision	11	0.60%	1164	62%	345	19%	239	13%	77	4%	22	1%	6	0.30%	**1864**
Knee	Primary	~	0.00%	10474	58%	3619	20%	2803	15%	1027	6%	148	1%	*	0.10%	**18102**
	Revision	*	0.60%	678	63%	176	16%	140	13%	64	6%	11	1%	~	0.10%	**1076**
Total		**25**		**25588**		**8805**		**6409**		**2098**		**311**		**55**		**43291**

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TABLE 5.1A INDICATIONS FOR SURGERY (N=43291)

Site	Type	Diagnosis	n	%
Hip	Primary	Osteoarthritis	20910	94%
		Avascular necrosis	794	4%
		Developmental dysplasia–hip	462	2%
		Other	272	1%
		Post–traumatic	219	1%
		Rheumatoid arthritis	162	1%
		Femoral acetabular impingement	113	1%
		Perthes	75	0%
		Slipped upper femoral epiphysis	67	0%
		Post–infective	20	0%
	Revision	Aseptic loosening	857	46%
		Infection	367	20%
		Other	358	19%
		Instability	281	15%

TABLE 5.1A INDICATIONS FOR SURGERY (N=43291)

Site	Type	Diagnosis	n	%
		Component failure	241	13%
		Pain of unknown origin	114	6%
		Peri–prosthetic Fracture	114	6%
		Avascular necrosis	*	0%
		Osteoarthritis	~	0%
Knee	Primary	Osteoarthritis	17615	97%
		Rheumatoid arthritis	309	2%
		Post–traumatic	225	1%
		Other	106	1%
		Avascular necrosis	67	0%
		Post–infective	23	0%
	Revision	Other	302	28%
		Infection	284	26%
		Instability	242	22%
		Aseptic loosening–tibia	181	17%
		Pain of unknown origin	140	13%
		Aseptic loosening–femur	120	11%
		Component failure–tibia	54	5%
		Component failure–femur	*	2%
		Avascular necrosis	~	0%

~ Denotes five cases or fewer

** Further suppression required to prevent disclosure of five cases or fewer*

TABLE 5.2A TYPE OF ANAESTHETIC AGENT USED IN PRIMARY AND REVISION ARTHROPLASTY (N=43291)

		Anaesthetic Agent																	
		Spinal and sedation		Spinal and regional		General and epidural		General		General and spinal		Spinal		General and regional		Epidural and spinal		Other	
Site	Type	n		n		n		n		n		n		n		n		n	
Hip	Primary	5187	*23%*	158	*1%*	*	*0%*	556	*2%*	348	*2%*	12577	*57%*	101	*0%*	186	*1%*	3118	*14%*
	Revision	310	*17%*	*	*1%*	~	*0%*	260	*14%*	109	*6%*	927	*50%*	37	*2%*	18	*1%*	187	*10%*
	Total	*5497*	*23%*	*173*	*1%*	*19*	*0%*	*816*	*3%*	*457*	*2%*	*13504*	*56%*	*138*	*1%*	*204*	*1%*	*3305*	*14%*
Knee	Primary	2930	*16%*	486	*3%*	*	*0%*	385	*2%*	210	*1%*	9394	*52%*	118	*1%*	140	*1%*	4427	*24%*
	Revision	120	*11%*	24	*2%*	~	*0%*	130	*12%*	28	*3%*	486	*45%*	26	*2%*	*	*1%*	255	*24%*
	Total	*3050*	*16%*	*510*	*3%*	*13*	*0%*	*515*	*3%*	*238*	*1%*	*9880*	*52%*	*144*	*1%*	*146*	*1%*	*4682*	*24%*
	Total	**8547**	***20%***	**683**	***2%***	**32**	*0%*	**1331**	*3%*	**695**	*2%*	**23384**	*54%*	**282**	*1%*	**350**	*1%*	**7987**	*18%*

~ Denotes five cases or fewer

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TABLE 5.3A CHEMICAL VENOUS THROMBOEMBOLISM PROPHYLAXIS, PRIMARY ARTHROPLASTY

CHEMICAL VENOUS THROMBOEMBOLISM PROPHYLAXIS	Hip		Knee		Total
	n	%	n	%	
Not recorded	737	3%	604	3%	1341
Aspirin (alone)	820	4%	608	3%	1428
Other	858	4%	694	4%	1552
Low molecular weight Heparin with Rivaroxaban	1256	6%	1027	6%	2283
Low molecular weight Heparin (alone)	6408	29%	5197	29%	11605
Aspirin with low molecular weight Heparin	12170	55%	9972	55%	22142
Total	**22249**		**18102**		**40351**

TABLE 5.4A CHEMICAL VENOUS THROMBOEMBOLISM PROPHYLAXIS, REVISION ARTHROPLASTY

CHEMICAL VENOUS THROMBOEMBOLISM PROPHYLAXIS	Hip		Knee		Total
	n	%	n	%	N
Aspirin with low molecular weight Heparin	1011	*54%*	563	*52%*	1574
Low molecular weight Heparin (alone)	558	*30%*	317	*29%*	875
Low molecular weight Heparin with Rivaroxaban	100	*5%*	90	*8%*	190
Other	91	*5%*	46	*4%*	137
Not recorded	62	*3%*	31	*3%*	93
Aspirin (alone)	42	*2%*	29	*3%*	71
Total	**1864**		**1076**		**2940**

TABLE 5.5A MECHANICAL VENOUS THROMBOEMBOLISM PROPHYLAXIS

		Intermittent Calf compression		Thrombo Embolus Deterrent (TED) stocking		Foot pump		Foot pump with TED stocking		Not recorded		Other		Total
		n	%	n	%	n	%	n	%	n	%	n	%	N
Hip	Primary	2039	*9%*	9029	*41%*	2443	*11%*	6738	*30%*	713	*3%*	1287	*6%*	22249
	Revision	171	*9%*	716	*38%*	321	*17%*	493	*26%*	58	*3%*	105	*6%*	1864
Knee	Primary	1253	*7%*	6959	*38%*	2455	*14%*	5909	*33%*	575	*3%*	951	*5%*	18102
	Revision	94	*9%*	373	*35%*	249	*23%*	287	*27%*	33	*3%*	40	*4%*	1076
	Total	***3557***	***8%***	***17077***	***39%***	***5468***	***13%***	***13427***	***31%***	***1379***	***3%***	***2383***	***6%***	***43291***

TABLE 5.6A TRANEXAMIC USE IN PRIMARY ARTHROPLASTY

	Primary			Revision		
	Hip	Knee	Total	Hip	Knee	Total
Tranexamic Acid Used	21610	17374	38984	1804	1002	2806
%	97%	96%	97%	97%	93%	95%
Total	22249	18102	40351	1864	1076	2940

TABLE 5.7.1A SURGICAL APPROACH HIP ARTHROPLASTY

Hip					
Surgical Approach	**Primary**		**Revision**		**Total**
	n	**%**	**n**	**%**	**N**
Posterior	14449	*65%*	1380	*74%*	15829
Lateral	5298	*24%*	379	*20%*	5677
Anterolateral (lateral)	1492	*7%*	22	*1%*	1514
Anterior	760	*3%*	20	*1%*	780
Posterolateral	225	*1%*	9	*0%*	234
Posterior, Trochanteric osteotomy	~	*0%*	*	*2%*	32
Trochanteric osteotomy	~	*0%*	*	*1%*	17
Lateral, Trochanteric osteotomy	10	*0%*	6	*0%*	16
Lateral, Image guided surgery	10	*0%*	~	*0%*	10
Lateral, Computer guided surgery	~	*0%*	~	*0%*	*
Anterior, Image guided surgery	~	*0%*	~	*0%*	*
Anterolateral and Trochanteric osteotomy	~	*0%*	~	*0%*	*
Total	**22249**		**1864**		**24113**

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TABLE 5.7.2A SURGICAL APPROACH KNEE ARTHROPLASTY

Surgical approach	Primary	%	Revision	%	Total
Medial Parapatellar	17647	97%	1062	99%	18709
Subvastus	382	2%	7	1%	389
Lateral Parapatellar	60	0%	~	0%	63
Medial Parapatellar	~	0%	~	0%	*
Medial Parapatellar	~	0%	~	0%	*
Medial Parapatellar, Lateral Parapatellar	~	0%	~	0%	*
Osteotomy	~	0%	~	0%	*
Medial Parapatellar	~	0%	~	0%	*
Tibial Tubercle	~	0%	~	0%	*
Tibial Tubercle	~	0%	~	0%	*
Lateral Parapatellar, Osteotomy	~	0%	~	0%	*
Total	**18102**		**1076**		**19178**

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TABLE 5.10A METHOD OF FIXATION PRIMARY HIP ARTHROPLASTY

Fixation Method	n	%
Cementless	14202	64%
Hybrid	5309	24%
Cemented	1991	9%
Reverse hybrid	105	0%
Unspecified	642	3%
Total	**22249**	100%

TABLE 5.11A CEMENTLESS FEMORAL STEM IMPLANTS - PRIMARY ARTHROPLASTY

Manufacturer: Brand Name	n	%
DePuy: Corail	4896	42%
Stryker: Accolade II	4085	35%
DePuy: Tri-Lock Bone Preservation System	1632	14%
Other	790	7%
Total	**11709**	**100**

TABLE 5.12A CEMENTLESS ACETABULAR CUP IMPLANTS - PRIMARY ARTHROPLASTY

Manufacturer, Tradename	n	%
Stryker: Trident	9398	49%
DePuy: Pinnacle	8309	44%
Other	1304	7%
Total	19011	100%

TABLE 5.13A BEARING SURFACE PRIMARY HIP ARTHROPLASTY

Bearing Surface Material	n	%
Ceramic on polyethylene	9260	66%
Metal on polyethylene	4427	31%
Ceramic on ceramic	258	2%
Ceramic on metal	83	1%
Metal on metal	66	1%
Total	**14094**	

TABLE 5.13.1A FEMORAL HEAD SIZE PRIMARY HIP ARTHROPLASTY

Femoral Head Size	n	%
32	10549	51%
36	7192	35%
28	2941	14%
22	81	0%
26	*	0%
44	~	0%
Total	**20824**	

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TABLE 5.14A PRIMARY HIP ARTHROPLASTY FIXATION OVER TIME: IMPLANTS, PROCEDURES

	IMPLANTS				PROCEDURES*		
YEAR	Cementless Implants used	Cemented Implants Used	Implants: % cementless	Total Implants	Cementless Procedures	Procedures: % Cementless	Total Procedures
	n	n	%	n	n	%	n
2015	501	200	71%	701	165	43%	382
2016	585	168	78%	753	224	57%	392
2017	842	195	81%	1,037	336	64%	527
2018	1,611	448	78%	2,059	637	62%	1021
2019	3,318	1,104	75%	4,422	1326	61%	2,181
2020	2,946	911	76%	3,857	1281	64%	2003
2021	3,449	1,145	75%	4,594	1562	64%	2,457
2022	4,482	1,438	76%	5,920	1976	62%	3,201
2023	6,664	2,112	76%	8,776	3012	62%	4,870
2024	7,107	1,516	82%	8,623	3683	71%	5,215
Total	**31,505**	**9,237**	77%	**40,742**	**14202**	64%	**22249**

**Multiple implants can be used per procedure; implant count includes accessories*

TABLE 5.15A TYPE OF KNEE ARTHROPLASTY

	Primary		Revision		
	Bilateral	Unilateral	Bilateral	Unilateral	Total
Total condylar knee replacement	458	15 858		885	17 201
Partial knee replacement		299			299
Unspecified	94	1 393	~	189	1 678
Total	**552**	**17 550**	*	**1 074**	**19 178**

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TABLE 5.15.1A KNEE ARTHROPLASTY IMPLANTS PRIMARY AND REVISION

Trade Name	n	%
Triathlon	10,029	57%
Attune	1,682	9%
Sigma Knee	1,535	9%
GMK	1,223	7%
LCS Complete	1,018	6%
B Braun Aesculap	567	3%
GMK Sphere	561	3%
Other	1134	6%

TABLE 5.16 REVISION HIP ARTHROPLASTY - COMPONENTS REVISED

Hip Components Revised	n	%
Both Acetabular and Femoral Component	945	51%
Unspecified (includes 2-stage revisions)	346	19%
Femoral Component	318	17%
Acetabular Component	118	6%
Bearing Surface only	116	6%
Prosthesis removed, cement spacer inserted	21	1%
Total	**1864**	

TABLE 5.16.1A FEMORAL STEM COMPONENTS USED: REVISION HIP ARTHROPLASTY

Manufacturer: Brand	n	%
Stryker: Exeter V40	450	41%
Stryker: Restoration	285	26%
DePuy: C-Stem AMT	102	9%
DePuy: Reclaim	90	8%
DePuy: Corail	77	7%
DePuy: Summit	28	3%
Stryker: GMRS	20	2%
Stryker: Accolade II	16	2%
other	15	1%
DePuy: LPS	9	1%
DePuy: Solution	7	1%
Total	***1099***	

TABLE 5.16.2A ACETABULAR CUP COMPONENTS USED: REVISION HIP ARTHROPLASTY

Manufacturer: Brand	n	%
Stryker: Tritanium	424	37%
DePuy: Pinnacle	303	26%
Stryker: Trident	232	20%
Stryker: Exeter X3 Rimfit	75	7%
Stryker: Exeter Contemporary	43	4%
DePuy: Marathon	28	2%
Zimmer Biomet: Trabecular Metal (Shell)	24	2%
Other	15	1%
Zimmer Biomet: Continuum	7	1%
Total	**1151**	

TABLE 5.17A COMPONENTS USED: REVISION TOTAL KNEE ARTHROPLASTY

Manufacturer: Brand	n	%
Other	15	3%
DePuy: LPS	6	1%
DePuy: LCS	6	1%
Stryker: GMRS	12	2%
DePuy: S-Rom Noiles	15	3%
Stryker: MRH	15	3%
Smith & Nephew: Legion	23	4%
DePuy: Sigma	63	12%
DePuy: Attune	65	12%
Stryker: Triathlon	313	59%
Total	**533**	
not all components are revised during knee revision arthroplasty		

TABLE 5.18A DURATION OF SURGERY BY SITE AND TYPE OF ARTHROPLASTY

Type	Site	Duration of Surgery in minutes	
		mean	median
Primary	Hip	70.9	69
	Knee	76.5	74
Revision	Hip	127.4	121
	Knee	122.4	118

TABLE 5.19A METHOD SKIN CLOSURE ARTHROPLASTY

Type	Site		Sutures	Sutures and Staples	Staples	Total
Primary	Hip	n	7,794	3,044	11,411	22,249
		%	*35%*	*14%*	*51%*	*100*
	Knee	n	3781	2934	10387	18,102
		%	*21%*	*22%*	*57%*	100%
Revision	Hip	n	584	335	945	1864
		%	*31%*	*18%*	*51%*	*100%*
	Knee	n	232	361	483	1076
		%	*22%*	*34%*	*45%*	*100%*
Total		**N**	**12391**	**7674**	**23226**	**43291**
		%	***29%***	***18%***	***54%***	***100%***

TABLE 5.20A DRAIN USAGE BY SITE AND TYPE OF ARTHROPLASTY

Type	Site	n	%
Primary	Hip	1553	7%
	Knee	2863	16%
Revision	Hip	139	7%
	Knee	128	12%

TABLE 6.1 INFECTION WITHIN 30 DAYS OF SURGERY BY SITE AND TYPE OF ARTHROPLASTY

Type	Site	n	N	%
Primary	Hip	107	22249	0.5%
	Knee	88	1864	0.5%
Revision	Hip	33	18102	1.8%
	Knee	10	1076	0.9%

TABLE 6.2 EARLY REVISION WITHIN ONE YEAR BY SITE AND TYPE OF ARTHROPLASTY

Type	Site	n	N	%
Primary	Hip	217	22249	1%
	Knee	139	1864	1%
Revision	Hip	173	18102	9%
	Knee	129	1076	12%

TABLE 6.3 PERIPROSTHETIC FRACTURE WITHIN 30 DAYS BY SITE AND TYPE OF ARTHROPLASTY

Type	Site	n	%	N
Primary	Hip	27	0.1%	22249
	Knee	9	0.1%	18102
Revision	Hip	*	0.3%	1864
	Knee	~	0.5%	1076

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TABLE 6.4 DISLOCATION WITHIN 30 DAYS BY SITE AND TYPE OF ARTHROPLASTY

Type	Site	n	%
Primary	Hip	47	0.20%
	Knee	*	0.10%
Revision	Hip	16	0.90%
	Knee	~	0.40%

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TABLE 6.5 VENOUS THROMBOEMBOLISM WITHIN 30 DAYS BY SITE AND TYPE OF ARTHROPLASTY

Type	Site	n	N	%
Primary	Hip	150	22249	0.70%
	Knee	224	18102	1.20%
Revision	Hip	*	1864	0.90%
	Knee	~	1076	0.20%

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TABLE 6.6 MORTALITY WITHIN 30 DAYS BY SITE AND TYPE OF ARTHROPLASTY

Type	Site	n	%
Primary	Hip	22	0.10%
	Knee	10	0.10%
Revision	Hip	~	0.10%
	Knee	~	0.00%

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TABLE 6.1 EQ-5D-5L PRIMARY ARTHROPLASTY OVER TIME

		Mean EQ5D-5L SCORE (Hobbins algorithm)			
Type	Site	Pre-op	6 months	2 yrs	5 yrs
Primary	Hip	0.265	0.828	0.834	0.818
	Knee	0.364	0.808	0.809	0.793

NOCA National Office of Clinical Audit

INOR Irish National Orthopaedic Register

IITOS THE IRISH INSTITUTE OF TRAUMA AND ORTHOPAEDIC SURGERY

TABLE 6.1.1A EQ-5D-5L COMPONENTS PREOP AND 6 MONTHS POST OP PRIMARY HIP ARTHROPLASTY

		PERCENTAGE OF RESPONDENTS				
COMPONENT	STAGE	No problems	Slight problems	Moderate problems	Severe problems	Extreme problems
Mobility	Pre-op	3%	11%	38%	45%	3%
	6 months	60%	24%	13%	4%	0%
Self-care	Pre-op	18%	23%	35%	22%	3%
	6 months	73%	19%	6%	1%	0%
Usual activities	Pre-op	4%	12%	34%	33%	17%
	6 months	59%	26%	12%	3%	1%
Pain/discomfort	Pre-op	1%	9%	37%	41%	11%
	6 months	48%	32%	14%	5%	1%
Anxiety/depression	Pre-op	43%	26%	21%	7%	3%
	6 months	79%	14%	6%	1%	0%

TABLE 6.1.2A EQ-5D-5L COMPONENTS PRE-OP AND 6 MONTHS POST OP PRIMARY KNEE ARTHROPLASTY

		PERCENTAGE OF RESPONDENTS				
COMPONENT	STAGE	No problems	Slight problems	Moderate problems	Severe problems	Extreme problems
Mobility	Pre-op	4%	13%	42%	40%	2%
	6 months	55%	27%	15%	4%	0%
Self-care	Pre-op	41%	23%	26%	9%	1%
	6 months	79%	15%	5%	1%	0%
Usual activities	Pre-op	5%	15%	38%	30%	12%
	6 months	53%	29%	14%	3%	1%
Pain/discomfort	Pre-op	2%	11%	40%	40%	8%
	6 months	35%	39%	19%	6%	1%
Anxiety/depression	Pre-op	48%	26%	19%	6%	2%
	6 months	76%	16%	6%	1%	0%

TABLE 6.2A MEAN OXFORD SCORE PRIMARY ARTHROPLASTY OVER TIME

TYPE	SITE	Pre-op	6 months	2 yrs	5 yrs
Primary	Hip	17.9	41.8	43.5	44.0
	Knee	19.5	38.2	40.3	40.5

NOCA National Office of Clinical Audit

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