



Glossary

A	
Acetabular component	The portion of a total hip replacement prosthesis that is inserted into the acetabulum – the socket part of a ball and socket joint.
Acetabular cup	See Acetabular component.
Acetabular prosthesis	See Acetabular component.
Antibiotic-loaded bone cement	See cement.
Arthrodesis	A procedure where the bones of a natural joint are fused together (stiffened).
Arthroplasty	A procedure where a natural joint is reconstructed with an artificial prosthesis.
ABHI	Association of British Healthcare Industries – the UK trade association of medical device suppliers.
ALVAL	Aseptic Lymphocyte-dominated Vasculitis-Associated Lesion. This term is used in the Annual Report to describe the generality of adverse responses to metal debris, but in its strict sense refers to the delayed type-IV hypersensitivity response.
ASA	American Society of Anaesthesiologists scoring system for grading the overall physical condition of the patient, as follows: P1 – fit and healthy; P2 – mild disease, not incapacitating; P3 – incapacitating systemic disease; P4 – life threatening disease; P5 – expected to die within 24 hrs without an operation.
B	
Bearing type	The two surfaces that articulate together in a joint replacement. Options include metal-on-polyethylene, metal-on-metal, ceramic-on-polyethylene, ceramic-on-metal and ceramic-on-ceramic.
Beyond Compliance	A system of post market surveillance initiated in 2013. Under this system a scrutiny committee closely monitors the usage and performance of implants which are new to the market in order that any problems may be quickly identified and that the necessary corrective actions are undertaken in order to protect patient safety.
Bilateral operation	Operation performed on both sides, e.g. left and right knee procedures, carried out during a single operation.
BMI	Body mass index. A statistical tool used to estimate a healthy body weight based on an individual's height. The BMI is calculated by dividing a person's weight (kg) by the square of their height (m ²).
BOA	British Orthopaedic Association – the professional body representing orthopaedic surgeons.
Bone cement	See cement.
Brand (of prosthesis)	The brand of a prosthesis (or implant) is the manufacturer's product name, e.g. the Exeter V40 brand for hips, the PFC Sigma brand for knees, the Zenith brand for ankles, the Delta Xtend brand for shoulders and the Coonrad Morrey for elbows.
C	
CQC	Care Quality Commission. Regulators of care provided by the NHS, local authorities, private companies and voluntary organisations.
Case ascertainment	Proportion of all relevant joint replacement procedures performed in England, Wales, Northern Ireland and the Isle of Man that are entered into the NJR.
Case mix	Term used to describe variation in surgical practice, relating to factors such as indications for surgery, patient age and gender.
Cement	The material used to fix cemented joint replacements to bone – polymethyl methacrylate (PMMA). Antibiotic can be added to bone cement to try and reduce the risk of infection.
Cemented	Prostheses designed to be fixed into the bone using cement.
Cementless	Prostheses designed to be fixed into the bone by bony ingrowth or ongrowth, without using cement.
Compliance	The percentage of all total joint procedures that have been entered into the NJR within any given period compared with the expected number of procedures performed. The expected number of procedures is based on the number of procedures submitted to HES and PEDW.

Compliance Confidence Interval (CI)	A 'Confidence Interval' (CI) is calculated to accompany anything being estimated from just a random sample of cases, for example the cumulative probability of revision; a CI tells us something about the range of values that the 'true' (population) value can take. Whilst calculated Confidence Intervals by their very nature will vary from sample to sample, calculation of a '95% Confidence Interval' (95% CI) means that 95% of all such calculated intervals should actually contain the 'true' value.
Confounding	Can occur when an attempt to quantify how a particular variable of interest affects outcome is hampered by another variable(s) being related to both the variable of interest and the outcome. For example a comparison of the revision rates between two distinct types of implant may be hampered by the fact that one implant has been used on an older group of patients than the other; age here is a 'confounder' for the relationship between implant type and outcome because revision rate also depends on age. Statistical methods may help to 'adjust' for such confounding variables.
Cox 'proportional hazards' model	A type of multivariable regression model used in survival analysis to look at the simultaneous effects of a number of variables ('predictors') on outcome (first revision or death). The effect of each variable is adjusted for the effects of all the other 'predictor' variables in the model so the Cox model can be used to adjust for 'confounders' (see above). Some regression models used in survival modelling make assumptions about the way the hazard rate changes with time (see 'hazard rate'). The Cox model doesn't make any assumptions about how the hazard rate changes however it does assume that the predictor variables affect the hazard rates in a 'proportional' way; the latter requiring some careful model checking when this method is used.
Cross-linked polyethylene	See modified polyethylene.
Cumulative incidence function (CIF)	A different way of estimating failure compared to Kaplan-Meier, see Kaplan-Meier. Also known as observed or crude failure, as the estimate reflects what is seen in practice.
Cup	See Acetabular component.
D	
Data collection periods for annual report analysis	The NJR Annual Report Part One reports on data collected between 1 April 2017 and 31 March 2018 – the 2017/18 financial year. The NJR Annual Report Parts Two and Four analyse data on hip, knee, ankle, elbow, and shoulder procedures undertaken between 1 January and 31 December 2017 inclusive – the 2017 calendar year. The NJR Annual Report Part Three reports on hip, knee, ankle and shoulder and elbow joint replacement revision rates for procedures that took place between 1 April 2003 and 31 December 2017.
DAIR	Debridement And Implant Retention. In cases of infection, the surgeon may debride (surgically clean) the surgical site and retain the joint replacement implants.
DAIR with Modular Exchange	Debridement And Implant Retention with Modular Exchange. In cases of infection where the implants are modular, the surgeon may debride (surgically clean) the surgical site, exchange the modular components (e.g. head, acetabular liner) and retain the non-modular joint replacement implants.
DDH	Developmental dysplasia of the hip. A condition where the hip joint is malformed, usually with a shallow socket (acetabulum), which may cause instability.
DH	Department of Health.
DVT	Deep vein thrombosis. A blood clot that can form in the veins of the leg and is recognised as a significant risk after joint replacement surgery.
E	
Excision arthroplasty	A procedure where the articular ends of the bones are simply excised, so that a gap is created between them, or when a joint replacement is removed and not replaced by another prosthesis.
F	
Femoral component (hip)	Part of a total hip joint that is inserted into the femur (thigh bone) of the patient. It normally consists of a stem and head (ball).
Femoral component (knee)	Portion of a knee prosthesis that is used to replace the articulating surface of the femur (thigh bone).
Femoral head	Spherical portion of the femoral component of the artificial hip replacement.

Femoral prosthesis	Portion of a total joint replacement used to replace damaged parts of the femur (thigh bone).
Femoral stem	The part of a modular femoral component inserted into the femur (thigh bone). Has a femoral head mounted on it to form the complete femoral component.
Funnel plot	A graphical device to compare unit or surgeon performance. Measures of performance (e.g. a ratio of number of observed events to the expected number based on case-mix) are plotted against an interpretable measure of precision. Control limits are shown to indicate acceptable performance. Points outside of the control limits suggest 'special cause' as opposed to 'common cause' variation (see for example D Spiegelhalter, Stats in Medicine, 2005).
G	
Glenoid component	The portion of a total shoulder replacement prosthesis that is inserted into the scapula – the socket part of a ball and socket joint in conventional shoulder replacement or the ball part in reverse shoulder replacement.
Glenoid head	Domed head portion of the glenoid component of the reverse shoulder replacement attached to the scapula.
H	
Hazard rate	Rate at which 'failures' occur at a given point in time after the operation conditional on 'survival' up to that point. In the case of first revision, for example, this is the rate at which new revisions occur in those previously unrevised.
Head	See Femoral head and/or Humeral head.
Healthcare provider	NHS or independent sector organisation that provides healthcare; in the case of the NJR, orthopaedic hip, knee, ankle, elbow or shoulder replacement surgery.
HES	Hospital Episode Statistics. Data on case mix, procedures, length of stay and other hospital statistics collected routinely by NHS hospitals in England.
HQIP	Healthcare Quality Improvement Partnership. Manages the NJR on behalf of NHS England. Promotes quality in health and social care services and works to increase the impact that clinical audit has nationally.
Humeral component (elbow)	Part of a total elbow joint that is inserted into the humerus (upper arm bone) of the patient to replace the articulating surface of the humerus.
Humeral component (shoulder)	Part of a total or partial shoulder joint that is inserted into the humerus (upper arm bone) of the patient. It normally consists of a humeral stem and head (ball) in conventional shoulder replacement or a humeral stem and a humeral cup in a reverse shoulder replacement.
Humeral cup	The shallow socket of a reverse shoulder replacement attached to the scapula.
Humeral head	Domed head portion of the humeral component of the artificial shoulder replacement attached to the humeral stem.
Humeral prosthesis	Portion of a total joint replacement used to replace damaged parts of the humerus (upper arm bone).
Humeral stem	The part of a modular humeral component inserted into the humerus (upper arm bone). Has a humeral head or humeral cup mounted on it to form the complete humeral component.
Hybrid procedure	Joint replacement procedure in which cement is used to fix one prosthetic component while the other is cementless. For hip procedures, the term hybrid covers both reverse hybrid (cementless stem, cemented socket) and hybrid (cemented stem, cementless socket).
I	
Image/computer-guided surgery	Surgery performed by the surgeon, using real-time images and data computed from these to assist alignment and positioning of prosthetic components.
Independent hospital	A hospital managed by a commercial company that predominantly treats privately-funded patients but does also treat NHS-funded patients.

Index joint	The primary joint replacement that is the subject of an NJR entry.
Indication (for surgery)	The reason for surgery. The NJR system allows for more than one indication to be recorded.
ISTC	Independent sector treatment centre (see Treatment centre).
K	
Kaplan-Meier	Used to estimate the cumulative probability of 'failure' at various times from the primary operation, also known as Net Failure. 'Failure' may be either a first revision or a death, depending on the context. The method properly takes into account 'censored' data. Censorings arise from incomplete follow-up; for revision, for example, a patient may have died or reached the end of the analysis period (end of 2017) without having been revised.
L	
Lateral resurfacing (elbow)	Partial resurfacing of the elbow with a humeral surface replacement component used with a lateral resurfacing head inserted with or without cement.
Linkable percentage	Linkable percentage is the percentage of all relevant procedures that have been entered into the NJR, which may be linked via NHS number to other procedures performed on the same patient.
Linkable procedures	Procedures entered into the NJR database that are linkable to a patient's previous or subsequent procedures by the patient's NHS number.
Linked total elbow	Where the humeral and ulnar parts of a total elbow replacement are physically connected.
LHMoM	Large head metal-on-metal. Where a metal femoral head of 36mm diameter or greater is used in conjunction with a femoral stem, and is articulating with either a metal resurfacing cup or a metal liner in a modular acetabular cup. Resurfacing hip replacements are excluded from this group.
LMWH	Low molecular weight Heparin. A blood-thinning drug used in the prevention and treatment of deep vein thrombosis (DVT).
M	
MDS	Minimum dataset, the set of data fields collected by the NJR. Some of the data fields are mandatory (i.e. they must be filled in). Fields that relate to patients' personal details must only be completed where informed patient consent has been obtained.
MDSv1	Minimum dataset version one, used to collect data from 1 April 2003. MDS version one closed to new data entry on 1 April 2005.
MDSv2	Minimum dataset version two, introduced on 1 April 2004. MDS version two replaced MDS version one as the official dataset on 1 June 2004.
MDSv3	Minimum dataset version three, introduced on 1 November 2007 replacing MDSv2 as the new official dataset.
MDSv4	Minimum dataset version four, introduced on 1 April 2010 replacing MDSv3 as the new official dataset. This dataset has the same hip and knee MDSv3 dataset but includes the data collection for total ankle replacement procedures.
MDSv5	Minimum dataset version five, introduced on 1 April 2012 replacing MDSv4 as the new official dataset. This dataset has the same hip, knee and ankle MDSv4 dataset but includes the data collection for total elbow and total shoulder replacement procedures.
MDSv6	Minimum dataset version six, introduced on 14 November 2014 replacing MDSv5 as the new official dataset. This dataset includes the data collection for hip, knee ankle, elbow and shoulder replacement procedures.
MHRA	Medicines and Healthcare Products Regulatory Agency – the UK regulatory body for medical devices.
Minimally-invasive surgery	Surgery performed using small incisions (usually less than 10cm). This may require the use of special instruments.

Mixing and matching	Also known as 'cross breeding'. Hip replacement procedure in which a surgeon chooses to implant a femoral component from one manufacturer with an acetabular component from another.
Modified Polyethylene	Any component made of polyethylene which has been modified in some way in order to improve its performance characteristics. Some of these processes involve chemical changes, such as increasing the cross-linking of the polymer chains or the addition of vitamin E and/or other antioxidants. Others are physical processes such as heat pressing or irradiation in a vacuum or inert gas.
Modular	Component composed of more than one piece, e.g. a modular acetabular cup shell component with a modular cup liner, or femoral stem coupled with a femoral head.
Monobloc	Component composed of, or supplied as, one piece, e.g. a monobloc knee tibial component.
N	
NHS	National Health Service.
NICE	National Institute for Health and Care Excellence.
NICE benchmark	See ODEP ratings.
NJR	National Joint Registry for England, Wales, Northern Ireland and the Isle of Man. The NJR has collected and analysed data on hip and knee replacements since 1 April 2003, on ankle replacements since 1 April 2010 and on elbow replacements and shoulder replacements since April 2012. It covers both the NHS and independent healthcare sectors to ensure complete recording of national activity in England, Wales, Northern Ireland and the Isle of Man.
NJR Centre	National coordinating centre for the NJR.
NJR StatsOnline	Web facility for viewing and downloading NJR statistics on www.njrcentre.org.uk .
O	
ODEP	Orthopaedic Data Evaluation Panel of the NHS Supply Chain. www.odep.org.uk .
ODEP ratings	ODEP ratings are the criteria for product categorisation of prostheses for primary total hip and knee replacement against benchmarks. An ODEP rating consists of a number and a letter and a star. The number represents the number of years for which the product's performance has been evidenced. The letter represents the strength of evidence (data) presented by the manufacturer. The star has been added to the rating system following revised guidelines from NICE in February 2014, in which a benchmark revision rate of less than 5% at 10 years was defined. The star is awarded where products are evidenced to comply with this benchmark. A* represents evidence above A and B. Ratings without a star signify compliance with the prior NICE guidance of a replacement rate of less than 10% at 10 years. The same benchmark has been adopted by ODEP for knees. All implants that are used without a 10-year benchmark should be followed up closely. See www.odep.org.uk .
OPCS-4	Office of Population, Censuses and Surveys: Classification of Surgical Operations and Procedures, 4th Revision – a list of surgical procedures and codes.
Outlier	Data for a surgeon, unit or implant brand that falls outside of acceptable control limits. See also 'Funnel plot'.
P	
Pantalar (ankle)	Affecting the whole talus, i.e. the ankle (tibio talar) joint, the subtalar (talo calcaneal) joint and the talonavicular joint.
Patella resurfacing	Replacement of the surface of the patella (knee cap) with a prosthesis.
Patellofemoral knee	Procedure involving replacement of the trochlear and replacement resurfacing of the patella.
Patellofemoral prosthesis	Two-piece knee prosthesis that provides a prosthetic (knee) articulation surface between the patella and trochlear.

Patient consent	Patient personal details may only be submitted to the NJR where explicit informed patient consent has been given or where patient consent has not been recorded. If a patient declines to give consent, only the anonymous operation and implant data may be submitted.
Patient physical status	See ASA.
Patient procedure	Type of procedure carried out on a patient, e.g. primary total prosthetic replacement using cement.
Patient-time	The total of the lengths of time a cohort of patients were 'at risk'. In the calculation of PTIRs for revision, for example, each individual patient's time is measured from the date of the primary operation to the date of first revision or, if there has been no revision, the date of patient's death or the last observation date. The individual time intervals are then added together.
PDS	The NHS Personal Demographics Service is the national electronic database of NHS patient demographic details. The NJR uses the PDS Demographic Batch Service (DBS) to source missing NHS numbers and to determine when patients recorded on the NJR have died.
PEDW	Patient Episode Database for Wales. The Welsh equivalent to Hospital Episode Statistics (HES) in England.
Primary hip/knee/ankle/elbow/shoulder replacement	The first time a total joint replacement operation is performed on any individual joint in a patient.
Prosthesis	The total of the lengths of time a cohort of prostheses were 'at risk'. In the calculation of PTIRs for revision, for example, each individual prosthesis time is measured from the date of the primary operation to the date of first revision or, if there has been no revision, the date of patient's death or the last observation date. The individual time intervals are then added together.
Prosthesis-time	The total of the lengths of time a cohort of prostheses were 'at risk'. In the calculation of PTIRs for revision, for example, each individual prosthesis time is measured from the date of the primary operation to the date of first revision or, if there has been no revision, the date of patient's death or the last observation date. The individual time intervals are then added together.
PROMs	Patient Reported Outcome Measures.
PTIR	PTIR Prosthesis-Time Incidence Rate. The total number of events (e.g. first revisions) divided by the total of the lengths of times the prosthesis was at risk (see 'Prosthesis-time').
Pulmonary Embolism	A pulmonary embolism is a blockage in the pulmonary artery, which is the blood vessel that carries blood from the heart to the lungs.
R	
Radial head component (elbow)	Part of a partial elbow joint that is inserted into the radius (outer lower arm bone) of the patient to replace the articulating surface of the radial head. May be monobloc or modular.
Resurfacing (hip)	Resurfacing of the femoral head with a surface replacement femoral prosthesis and insertion of a monobloc acetabular cup, with or without cement.
Resurfacing (shoulder)	Resurfacing of the humeral head with a surface replacement humeral prosthesis inserted, with or without cement.
Reverse shoulder replacement	Replacement of the shoulder joint where a glenoid head is attached to the scapula and the humeral cup to the humerus.
Revision burden	The proportion of revision procedures carried out as a percentage of the total number of surgeries on that particular joint.
Revision hip/knee/ankle/elbow/shoulder replacement	Operation performed to remove (and usually replace) one or more components of a total joint prosthesis for whatever reason.

S	
Shoulder hemi-arthroplasty	Replacement of the humeral head with a humeral stem and head or shoulder resurfacing component which articulates with the natural glenoid.
Single-stage revision	A revision carried out in a single operation.
SOAL	Lower Layer Super Output Areas. Geographical areas for the collection and publication of small area statistics. These are designed to contain a minimum population of 1,000 and a mean population size of 1,500. Please also see Office for National Statistics at www.ons.gov.uk .
Subtalar	The joints between the talus and the calcaneum, also known as the talocalcaneal joints.
Surgical approach	Method used by a surgeon to gain access to, and expose, the joint.
Survival (or failure) analysis	Statistical methods to look at time to a defined failure 'event' (for example either first revision or death); see Kaplan-Meier estimates and Cox 'proportional hazards' models. These methods can take into account cases with incomplete follow-up ('censored' observations).
T	
Talar component	Portion of an ankle prosthesis that is used to replace the articulating surface of the talus at the ankle joint.
TAR	Total ankle replacement (total ankle arthroplasty). Replacement of both tibial and talar surfaces, with or without cement.
TED stockings	Thrombo embolus deterrent (TED) stockings. Elasticised stockings that can be worn by patients following surgery and which may help reduce the risk of deep vein thrombosis (DVT).
THR	Total hip replacement (total hip arthroplasty). Replacement of the femoral head with a stemmed femoral prosthesis and insertion of an acetabular cup, with or without cement.
Thromboprophylaxis	Drug or other post-operative regime prescribed to patients with the aim of preventing blood clot formation, usually deep vein thrombosis (DVT), in the post-operative period.
Tibial component (knee)	Portion of a knee prosthesis that is used to replace the articulating surface of the tibia (shin bone) at the knee joint. May be modular or monobloc (one piece).
Tibial component (ankle)	Portion of an ankle prosthesis that is used to replace the articulating surface of the tibia (shin bone) at the ankle joint.
TKR	Total knee replacement (total knee arthroplasty). Replacement of both tibial and femoral condyles (with or without resurfacing of the patella), with or without cement.
Total condylar knee	Type of knee prosthesis that replaces the complete contact area between the femur and the tibia of a patient's knee.
Treatment centre	Treatment centres are dedicated units that offer elective and short-stay surgery and diagnostic procedures in specialties such as ophthalmology, orthopaedic and other conditions. These include hip, knee, ankle, elbow, and shoulder replacements. Treatment centres may be privately funded (independent sector treatment centre – ISTC). NHS Treatment Centres exist but their data is included in those of the English NHS Trusts and Welsh Local Health Boards to which they are attached.
Trochanter	Bony protuberance of the femur, found on its upper outer aspect.
Trochanteric osteotomy	Temporary incision of the trochanter, used to aid exposure of hip joint during some types of total hip replacement.
Two-stage revision	A revision procedure carried out as two operations, often used in the treatment of deep infection.
Type (of prosthesis)	Type of prosthesis is the generic description of a prosthesis, e.g. modular cemented stem (hip), patellofemoral joint (knee), talar component (ankle), reverse shoulder (shoulder) and radial head replacement (elbow).

U

Ulnar component (elbow)	Part of a total elbow joint that is inserted into the ulna (inner lower arm bone) of the patient to replace the articulating surface of the ulna. May be linked or unlinked.
Uncemented	See cementless.
Unicondylar arthroplasty	Replacement of one tibial condyle and one femoral condyle in the knee, with or without resurfacing of the patella.
Unicondylar knee replacement	See Unicondylar arthroplasty.
Unilateral operation	Operation performed on one side only, e.g. left hip.
Unlinked total elbow	Where the humeral and ulnar parts of a total elbow replacement are not physically connected.