

Research project title	Principal investigator	Project status	Institution	Classification	Date project approved	Publication details	Lay summary
Predicting the risk of venous thromboembolism (VTE) following primary total hip and knee replacement	Gulraj Matharu	In progress	University of Bristol	Internal	Dec-18		<p>the legs and lungs, are common and potentially life-threatening complications occurring after hip and knee replacement. VTE is also associated with substantial costs to the health service. Patients have their risk of VTE assessed before undergoing joint replacement, and usually receive blood-thinning medications following surgery. Both these measures aim to reduce the risk of developing VTE. Risk assessment before surgery is important because some patients are at higher risk of VTE than others (e.g. those with cancer, or those with a history of VTE) and therefore may need different medications or treatments to lower their risk. However no risk assessment tool for VTE in current use has been tested appropriately to confirm it is effective for identifying at risk patients. Furthermore there is a lack of research evidence as a recent review of published studies did not identify any good quality studies of VTE risk assessment tools in patients</p>
Mixed methods evaluation of the Getting it Right First Time programme - improvements to NHS orthopaedic care in England	Sarah Jasim	In progress	UCLH/NIHR CLAHRC North Thames	Internal	Nov-18		<p>This project will focus on a quantitative and health economics evaluation of the implementation of a complex intervention, 'the Getting It Right First Time (GIRFT) programme', which seeks to improve the quality and cost-effectiveness of NHS elective orthopaedic care in England. We aim to assess whether the GIRFT programme has reduced variations in orthopaedic practice and expenditure, and improved patient outcome measures.</p>
The association between frailty and outcomes after primary knee replacement'	Robert Middleton	In progress	University of Oxford	Internal	Oct-18		<p>UK, and this number is predicted to rise. This increase in demand is due in part to an increasing population size, and to an increasing average age. Of those undergoing primary knee replacements, most are over the age of 60, with an average age of 70 years. As such it is unsurprising that some individuals have additional health problems (e.g. heart disease or diabetes). Some health problems can affect outcomes (such as risk of death) after surgery.</p> <p>However, whilst understanding the impact of additional 'diseases' after knee replacement is important, such an approach does not take into account the overall fitness of an individual. As we age we can become more vulnerable to illness, can take longer to recover, and can be more at risk during and after surgery. This is due to a combination of factors, including not just physical</p>

<p>A descriptive study of the burden of comorbidity of patients undergoing total hip arthroplasty</p>	<p>Rory Ferguson</p>	<p>In progress</p>	<p>University of Oxford</p>	<p>External</p>	<p>Jul-18</p>		<p>function in thousands of patients with hip arthritis each year. Whether or not a total hip replacement has a successful outcome may be affected by a patient's age, gender and body mass index at the time of surgery. The outcome of surgery may also be affected if a patient has other long-term health disorders, so called 'comorbidities', in addition to hip arthritis. For example, previous studies have shown that patients with more comorbidities are more likely to have complications after total hip replacement, such as infections. The outcomes of total hip replacements in different countries are often compared to provide insights into healthcare in different counties. So that the comparisons are fair, it is necessary to account for differences in the patients undergoing surgery. To date, there have been a small number of studies that have investigated how patients undergoing surgery in different countries compare. One previous</p>
<p>Procurement, competition and diversification in medical devices: a case-study on hip implants.</p>	<p>Charlotte Davies</p>	<p>In progress</p>	<p>Norwich Medical School, UEA</p>	<p>Internal</p>	<p>Jun-18</p>		<p>and how the NHS interacts with the manufacturers. Given increasing financial constraints on the NHS, focus has turned to efficiency savings, especially NHS purchasing. Using National Joint Registry data we will be able to examine a neglected issue: the role of the suppliers of the implants themselves and how they interact with the NHS. This analysis and database will also enable us to explore some of the implications of the recommendations made in the recent pivotal report by Briggs et al in Getting it Right First Time.</p> <p>On the supply side, our previous work (Davies 2011) used NJR and HES linked data to establish a striking picture of the industry which manufactures and supplies hip implants. It forms a very concentrated market with just two main manufacturers (Stryker and Depuy) holding 65% of the market. This raised a potential</p>
<p>Validation of predicted 90-day mortality after major surgery: A comparison of different comorbidity measures</p>	<p>Anne Garland</p>	<p>In progress</p>	<p>Inst of Surgical Sciences, Uppsala University, Uppsala, Sweden</p>	<p>Internal</p>	<p>Jun-18</p>		<p>is very low, and this surgery is considered very safe and successful. But patients may ask themselves or their surgeons the anxious question — is there a risk that surgery will kill me? Depending on how old and how sick a patient is, this issue can be more or less pressing. We therefore address the question of whether it is possible to estimate the risk of death during or within three months after hip replacement surgery.</p> <p>The risk of death depends on the type of medical intervention itself, but it also depends on the patient. For instance, if the patient is old or sick from other diseases, the risk of death is higher. The patient is more "fragile". In research doctors try to measure the patient's health condition (or "fragility") through complicated methods that are not possible to use in the clinic. Our research question is: Could easily accessible information in the clinic be just as good at measuring the patient's health</p>

<p>Do collared corail stems have a reduced risk of revision due to fracture in the national joint registry (UK)</p>	<p>Josh Lamb</p>	<p>In progress</p>	<p>Yorkshire and Humber Deanery</p>	<p>External</p>	<p>Mar-18</p>		<p>A peri-prosthetic femoral fracture (PFF) following a THR is an uncommon, but potentially devastating complication. It typically requires further surgical intervention and is associated with increased morbidity, mortality similar to that following neck of femur fracture and is costly. A PFF can either occur intra- or postoperatively.</p> <p>Patients with cementless implants are at a significantly higher risk of sustaining a PFF as compared to cemented implants. At present, its incidence and factors contributing to development of a PFF is not known. The main modifiable risk factor is the implant used. However the effect of size, shape and surface covering on the risk of subsequent PFF is not known.</p> <p>Our proposed research aims to look at all cases of revision due to PFF in THRs using cementless stems. We will ensure that the data for each THR type we compare is similar in terms of patient</p>
<p>The uptake and impact of new joint replacement implants</p>	<p>Chris Penfold</p>	<p>In progress</p>	<p>University of Bristol</p>	<p>Internal</p>	<p>Mar-18</p>		<p>New implants are often modifications of existing implants rather than new designs and can be marketed based on being equivalent to something already available. These claims of equivalency do not necessarily mean the new implant is effective or safe. Most new implants are safe and work well, but some had safety problems which were not known until they had been implanted for several years and in large numbers of patients.</p> <p>To support innovation while protecting patients, a set of guidelines were proposed which suggested that after they are approved, new implants should be introduced in a controlled manner. This would allow a small number of people to be closely monitored, and quickly identify safety concerns. We do not know whether this approach is being used in the UK.</p> <p>Since there are so many implants to choose from, surgeons may consider changing to a new implant. It is thought that the earliest</p>
<p>Does the identification of outlying surgeons lead to changes in surgical practice?</p>	<p>Chris Penfold</p>	<p>In progress</p>	<p>University of Bristol</p>	<p>Internal</p>	<p>Mar-18</p>		<p>operations, often performed to provide pain relief and improve mobility. These joint replacements are normally very successful, but people who receive these joint replacements occasionally need a further operation to replace part or all of the artificial joint (a revision). The National Joint Registry for England, Wales, Northern Ireland and the Isle of Man (NJR) monitors how frequently joint replacement operations performed by consultant surgeons have been revised, and confidentially contacts those with revision rates which are higher than expected (called 'potential outliers'), after accounting for differences between patients such as the patient's age or gender and why they needed the operation (e.g. due to osteoarthritis).</p> <p>This process is intended to encourage surgeons flagged up as potential 'outliers' to change aspects of their surgical practice which may have caused their comparatively high rate of revisions.</p>

Does ceramic bearing surface reduce infection rate after primary hip replacement?	Ajay Malviya	In progress	Northumbria Healthcare NHS Trust	Internal	Mar-18	<p>which frequently requires further (revision) surgery, prolongs recovery and leads to poor outcomes. Such infections are a significant burden to healthcare services and are likely to result in undue personal suffering for the patients concerned. While several strategies are employed to prevent infection, recent evidence suggests that using a replacement joint with a ceramic on ceramic bearing surface may help reduce infection.</p> <p>In this study we will analyse National Joint Registry data, comparing the revision rate for infection after hip replacement in different types of bearing surfaces (ceramic on ceramic, ceramic on polyethylene and metal on polyethylene), commonly used during surgery.</p> <p>A report by Public Health England (2015-2016) of surgical site infection in NHS hospitals in England suggests an average infection rate of 0.5% after primary hip replacement and 1.4%</p>
Is there an association between previous or current inpatient admission for another cause and mortality following total joint replacement?	Michael Whitehouse	In progress	University of Bristol	Internal	Mar-18	<p>pain and loss of function that occurs with joint conditions such as osteoarthritis. The majority of joint replacements performed are first time replacements, for example over 200,000 first time hip and knee replacements were performed in the NHS in 2016. Approximately one in ten patients will also require a redo, or revision, joint replacement. Whilst joint replacement is a safe procedure, there is a chance of serious complications following all types of major surgery, including joint replacement, this includes the risk of death. Since the National Joint Registry started collecting data in 2003, the risk of death following primary joint replacement has approximately halved. The risk is higher for patients undergoing redo compared to first time surgery and for those with pre-existing medical conditions. We wish to look at whether patients who have been recently admitted to hospital before undergoing joint replacement are at a higher risk of death</p>
Factors affecting the outcome of the Oxford Knee	David Murray	In progress	University of Bristol	External	Mar-18	<p>Knee replacement is an effective treatment for severe arthritis of the knee, and may be either total (TKR) or partial (PKR): With TKR the whole joint is replaced, whereas with PKR only the damaged part is replaced and the remaining surfaces and ligaments are preserved. As a result, with PKR, the operation is less invasive and the knee functions more normally. Analysis of National Joint Registry data and other databases has shown that although PKR provides a quicker recovery, with fewer complications and better function than TKR, the failure rate is about three times higher. This is interesting as in a number of centres around the world which specialise in PKR the revision rate of PKR and TKR are similar. The aim of this study is to understand why the revision rate of PKR is so high nationally and to identify ways that it can be decreased. This study will focus on the most widely used PKR, the Oxford Knee.</p>

Associations between reconstructive strategy and component design on outcome patterns in primary knee replacement	Robert Middleton	In progress	University of Oxford	Internal	Mar-18		<p>with a painful arthritic knee. In 2016 over 100,000 knee replacements were performed. This number is expected to rise in the future. When deciding on knee replacement, there are many important decisions to be made.</p> <p>One decision is how much of the knee to replace (based on how arthritic the knee is), using different types of knee replacement. One type is the total knee replacement (TKR), which replaces bone surfaces between the thigh and shin bone. The unicompartmental knee replacement (UKR) however replaces only one side of the knee joint. There are pros and cons to each. Some surgeons use a unicompartmental knee replacement when only part of the knee is involved, whereas others will use a total knee replacement.</p>
Establishing risk profiles for incident peri-prosthetic fractures, associated health care costs and projections for the future	Celia Gregson	In progress	University of Bristol	Internal	Dec-17		<p>Periprosthetic fractures (PPF) are fractures which occur in the same bone that has been treated with a joint replacement. As our population ages, more people are receiving joint replacements and more are sustaining fractures, yet we currently do not know, in the UK, how frequently such PPFs occur, nor do we know how to identify those patients at highest risk of sustain a PPF, nor do we know the costs of these PPFs in terms of the time spent in hospital, the financial costs to the NHS, and the cost to the patient in terms of survival. We aim to answer these questions and determine how patterns in PPFs have changed over the last decade for men and women in England, which factors predict sustaining a PPF, and which predict good and bad outcomes after PPF.</p>
Acetabular cup geometry and revision risk for TKR following primary THR	Hiren Divecha	In progress	Wrightington Hospital	External	Jul-17		<p>The aim of this research is to determine if the type of cup used in "first time" hip replacements increases the risk of needing "second time" surgery for joint replacement instability.</p>
Function of the acetabular cup bearing surface in hip replacement/resurfacing designs'	Jonathan Jeffers	In progress	Imperial College London	External	Jul-17		<p>There are many designs of total hip replacement available on the market, and they do not all perform the same. One type of hip replacement is called surface replacement. It just replaces the surfaces of the worn out joint. Two surface replacement implants are the BHR and ADEPT implants that are identical apart from the amount of rotation they provide for the hip joint. This project will compare the revision rate of these two implants to see whether the different range of motion affects the outcome of the surgery, to inform future hip implant designs.</p>

The effect of cement type on the survivorship of cemented total hip replacement	Tim Board	In progress	Wrightington Hospital & University of Manchester	External	Jun-17		<p>Joint Registry (NJR) to investigate whether the type of cement used in total hip replacements (THR) affects the outcome of that replacement. Cemented total hip replacement was developed in the 1960s and around 300,000 such joint replacements are recorded in the NJR. During a THR the surgeon uses cement to secure the femoral (stem) and acetabular/pelvic (socket) implants into the bone.</p> <p>A downside of hip replacements is that they don't work forever and the implants can become infected or loose over time. There are a variety of different types of cements used and little data to say whether one lasts longer than another. Research from the Scandinavian joint register suggests 'Palacos' type cement might last longer than others for the stem implant although they make no comment on socket survival. During this study we want to use the data captured within the NJR to answer this important clinical</p>
Extended benchmarking of hip prostheses'	Jonathan Evans	In progress	University of Bristol	Internal	May-17	<p>systematic review and meta-analysis of case series and national registry reports with more than 15 years of follow-up Jonathan T Evans, Jonathan P Evans, Robert Walker, Ashley Blom, Michael Whitehouse, Adrian Sayers, The Lancet, February 2019 https://doi.org/10.1016/S0140-6736(18)31665-9</p> <p>How long does a knee replacement last? A systematic review and meta-analysis of case series and national registry reports with more than 15 years of follow-up Jonathan T Evans, Robert Walker,</p>	<p>Using one of the most widely used prostheses as a reference (Exeter stem) we aim to investigate implant failure using data from two long-term case series in conjunction with NJR data to predict long-term prosthesis survivorship and establish long-term benchmarks for hip prostheses.</p>
Improving Outcomes of Shoulder Joint Replacement Surgery	Richard Craig	In progress	University of Oxford	Internal	May-17		<p>This project will look at a large database of UK patients that have had a shoulder replacement. This research project will study this database to help to identify patients who may benefit most from such surgery and which patients are less likely to benefit. The results will help us develop national guidelines to help patients and surgeons decide on the best treatments.</p>
Assessing the non-inferiority of Hip and Knee replacements in the NJR	Kevin Deere	In progress	University of Bristol	Internal	Apr-17	<p>M., Blom, A. W., & Sayers, A. (2019). Assessing the non-inferiority of prosthesis constructs used in total and unicondylar knee replacements using data from the National Joint Registry of England, Wales, Northern Ireland and the Isle of Man: a benchmarking study. <i>BMJ Open</i>, 9(4), e026736. https://doi.org/10.1136/BMJOPEN-2018-026736</p> <p>Deere, K. C., Whitehouse, M. R., Porter, M., Blom, A. W., & Sayers, A. (2019). Assessing the non-inferiority of prosthesis constructs used in hip replacement using</p>	<p>replacements. These data are useful for surgeons but there is currently very limited scrutiny of the differing performances between the brands of different prostheses.</p> <p>By selecting a hip / knee brand with a low failure rate as a reference group, we will perform statistical analyses to directly compare the performance of all the stem and cup combinations used in hip replacements and all the knee brands used in knee replacement surgery against this reference.</p> <p>This will demonstrate if any brands are performing poorly in comparison to the best performing implants, allowing patients and surgeons to assess the relative performance as judged by revision of the construct of each brand.</p>

<p>The effect of femoral component size on risk of periprosthetic fracture following primary cemented hip replacement</p>	<p>Tanvir Khan</p>	<p>In progress</p>	<p>Royal Devon & Exeter NHS Foundation Trust</p>	<p>External</p>	<p>Mar-17</p>	<p>The influence of cemented femoral stem choice on the incidence of revision for periprosthetic fracture after primary total hip arthroplasty; an analysis of national joint registry data. J Palan, MC Smith, P Gregg, S Mellon, A Kulkarni, K Tucker, AW Blom, DW Murray, H Pandit. Bone Joint J. 2016 Oct;98-B(10):1347-1354.</p>	<p>Although uncommon, a periprosthetic fracture after a total hip replacement is a devastating complication associated with an increased morbidity and mortality for patients. The incidence of periprosthetic fractures is increasing. The type of hip replacement being used may influence the risk of sustaining a periprosthetic fracture and it is unclear as to which design of femoral stem leads to a higher incidence of periprosthetic fracture. This study aims to identify any trends in patient demographics and incidence of periprosthetic fractures and if different implant designs, both cemented and uncemented, affect the incidence of periprosthetic fractures around the femoral stem.</p>
<p>National Revision rates of the Corail / Pinnacle 36mm metal on metal total hip replacements</p>	<p>Ben Bolland</p>	<p>In progress</p>	<p>Musgrove Park Hospital</p>	<p>External</p>	<p>Mar-17</p>	<p>Matharu GS, Hunt L, Murray DW, Howard P, Pandit HG, Blom A, Bolland B, Judge A. Has the revision rate changed for 36 mm metal-on-metal total hip arthroplasties with Pinnacle cups by year of implantation? An interrupted time-series analysis using data from the National Joint Registry for England and Wales. The Bone and Joint Journal (In Press- accepted 13th September 2017).</p>	<p>Ongoing surveillance of metal on metal implants is essential to ensure patient safety. This study will help identify factors associated with early failure. This will allow optimization of future follow up requirements and provide essential information over future risks and prognosis for the patient.</p>
<p>Temporal trends in the use of, and survivorship rates, of Total Hip Replacement in the Very Young Patient'</p>	<p>Nick Peterson</p>	<p>In progress</p>	<p>University of Liverpool</p>	<p>Internal</p>	<p>Jan-17</p>	<p>Metcalfe, D., Peterson, N., Wilkinson, J. M., & Perry, D. C. (2018). Temporal trends and survivorship of total hip arthroplasty in very young patients. The Bone & Joint Journal, 100–B(10), 1320–1329. https://doi.org/10.1302/0301-620X.100B10.BJJ-2017-1441.R2</p>	<p>This study aims to assess how many cases of THR have been performed for very young patients (<20 years old) since the introduction of the NJR, and if this has changed in recent years. We aim to learn how long implants survive in very young patients and whether this is different to the findings of studies amongst older adults.</p>
<p>Does the use of trabecular metal acetabular components reduce the subsequent risk of revision following primary and revision total hip replacement? [Pandit]</p>	<p>Hemant Pandit</p>	<p>Complete</p>	<p>University of Oxford</p>	<p>External</p>	<p>Dec-16</p>	<p>HG. Trabecular metal acetabular components reduce the risk of revision following primary total hip arthroplasty: A propensity score matched study from the National Joint Registry for England and Wales. The Journal of Arthroplasty (In Press- accepted 26th August 2017). Matharu, G. S., Judge, A., Murray, D. W., & Pandit, H. G. (2018). Trabecular Metal Versus Non-Trabecular Metal Acetabular Components and the Risk of Re-Revision Following Revision Total Hip Arthroplasty. The Journal of Bone and Joint Surgery, 100(13), 1132–1140.</p>	<p>This research will represent the largest study assessing the results of trabecular metal sockets following both first and revision hip replacement procedures. Our work will establish whether newer and more expensive trabecular metal sockets should be used in preference to standard hip sockets.</p>

<p>The Influence of Body Mass Index on Microarchitecture and Bone Remodelling of Subchondral Bone in Knee Osteoarthritis Patients</p>	<p>Chris Jones</p>	<p>In progress</p>	<p>Perth Orthopaedic Institute</p>	<p>External</p>	<p>Dec-16</p>		<p>between obesity (Body Mass Index; BMI) and the development of osteoarthritis (OA). We hypothesize that in obese patients (BMI >30) there are primary structural changes in the supporting bone underneath the articular cartilage (subchondral bone) in their knee joints that may lead to the development of end-stage arthritis at an earlier age. If this is the case then we expect that this will be reflected in obese patients having a younger average age for total knee replacement.</p> <p>The project will use the tibial plateaus from patients undergoing total knee replacement. This bone would routinely be discarded after surgery, however it will be collected in a sterile fashion and transported to the UWA Orthopaedic Research laboratory where the precise microarchitecture of the bone can be analysed. The results of this analysis will be compared to the age and BMI of the</p>
<p>UTMOST: Risk-benefit and costs of unicompartmental (compared to total) knee replacement for patients with multiple co-morbidities: a non-randomised study, and different novel approaches to minimise confounding'</p>	<p>Daniel Prieto-Alhambra</p>	<p>In progress</p>	<p>University of Oxford</p>	<p>Internal</p>	<p>Oct-16</p>		<p>1. Understanding whether observational data from the National Joint Registry, linked to hospital records, and patient reported outcomes data can be used to compare two different surgical alternatives for patients in need for knee replacement: unicompartmental versus total. We will compare the results obtained from such study to those obtained from an on going randomised study, where patients have been randomly (as by chance) allocated to receive either unicompartmental or total knee replacement. A number of advanced statistical methods commonly used in the evaluation of drug and vaccine safety will be tested to learn whether they can replicate the results from more expensive and complex randomised studies.</p> <p>2. The method/s deemed to be valid to replicate randomised studies using observational data will then be used to study the</p>
<p>UKSAFE: Is it safe to completely disinvest in TJR follow-up or will this expose people to harm?'</p>	<p>Philip Conaghan</p>	<p>In progress</p>	<p>University of Oxford; University of Leeds</p>	<p>Internal</p>	<p>Oct-16</p>		<p>medicine, providing considerable improvement in quality of life to people suffering with severe joint damage. In 2013 over 170,000 total hip and knee replacements were conducted. The UK population is growing steadily older and more obese. As a result, the number of joint replacements performed each year is likely to continue to increase. Although joint replacement is an extremely successful procedure, sometimes problems can develop with the replaced joint over time and in a small percentage of people further surgery is required. Follow-up care is provided to ensure that any problems are recognised as early as possible. Providing follow-up for all joint replacement patients in the years after their surgery places an enormous burden on the NHS, in addition to the huge cost for conducting the surgery itself. The NHS is under increasing pressure to reduce its costs and our recent work suggests that many hospitals have dramatically reduced the</p>

<p>ATLAS- The role of hospital organisation, surgical factors, and the enhanced recovery pathway, on patient outcomes and NHS costs following primary hip and knee replacement surgery: spatial and longitudinal analysis of routine data</p>	<p>Andrew Judge</p>	<p>In progress</p>	<p>University of Oxford</p>	<p>Internal</p>	<p>Jul-16</p>		<p>areas of the country. This may be explained by a hospital treating more complex and sicker patients, and this must be accounted for. However, differences in patient outcomes could also be explained by how hospitals organised their services, such as bed availability, numbers of operating theatres and specialist surgeons, using new surgical techniques, or centralising care into specialist high volume hospitals. Knowledge of this would help NHS managers to change the way services are organised and reduce variation in outcomes between hospitals.</p> <p>A new patient pathway for hip and knee replacement called enhanced recovery has been introduced in NHS and private hospitals. It is hoped this will benefit patients, through patient education before and after surgery, that includes making changes around the home, exercises to strengthen the joint and changes to diet, to help reduce the risk of complications and speed up a</p>
<p>The effect of antibiotic-loaded bone cement on risk of revision following primary knee replacement'</p>	<p>Simon Jameson</p>	<p>In progress</p>	<p>South Tees Hospitals NHS Foundation Trust</p>	<p>Internal</p>	<p>Jul-16</p>		<p>Infection following joint replacement is a rare but significant complication. Bone cement is commonly used to secure joint replacements into place and can be impregnated with antibiotics in order to potentially reduce the risk of infection. The benefit of antibiotic-loaded bone cement (ALBC) in terms of reduction in revision surgery has been documented after hip replacement. However, evidence for ALBC in total knee replacement (TKR) is less clear. Most hospitals in the UK now use ALBC routinely. However, there are potentially risks (possibly poorer long-term survival, as the addition of antibiotics may reduce the structural stability of the cement, and may increase antibiotic resistance) and additional costs associated with its use. The objective of this study is to use data from the NJR to evaluate the influence of ALBC on revision risk following TKR.</p>
<p>How reliable is the NJR retrospective dataset for tracking the outcomes of hip and knee replacement: A comparison of 12 years of the NJR and HES/ PEDW Datasets</p>	<p>Adrian Sayers</p>	<p>In progress</p>	<p>University of Bristol</p>	<p>Internal</p>	<p>Mar-16</p>		<p>All official outputs from the NJR depend on the accurate and fair reporting of procedures. Some commentators suggest that under-reporting of procedures is common and the results from the NJR are difficult to trust. Using an alternative method of recording information on joint replacement procedures, known as the Hospital Episode Statistics in England and Patient Episode Database in Wales, we will compare the rate of reporting of arthroplasty procedures between the NJR and HES, to understand what consequences this may have on NJR reports.</p>

<p>A comparison of revision rates of Smith & Nephew manufactured cobalt chrome and oxidised zirconium bicondylar knee prostheses.</p>	<p>Blair Fraser</p>	<p>Complete</p>	<p>Smith & Nephew</p>	<p>External</p>	<p>Feb-16</p>		<p>metal technology developed by Smith & Nephew. It is used to manufacture knee implants as a wear resistant alternative to the more commonly used cobalt chrome metal alloy. The clinical performance of both of these materials has been tracked in joint replacement registries for over 10 years, in both total hip and total knee replacements. The primary event being tracked is revision surgery, where failure of the artificial joint leads to the removal and replacement of some or all of the components. This research project will analyse data from the National Joint Registry to compare how often knee implants made of cobalt chrome or oxidized zirconium are revised. The analysis will take into account various factors that may influence the chance of revision, such as age, gender, the overall health status of the patient, the diagnosis leading to the primary surgery, the reasons for revision, the implantation technique and the implant design.</p>
<p>Safety and Feasibility Evaluation of Tourniquets for Total Knee Replacement (SAFE TKR) Study – A Retrospective Cohort Study.</p>	<p>Peter Wall</p>	<p>In progress</p>	<p>University of Warwick</p>	<p>Internal</p>	<p>Dec-15</p>		<p>Total knee replacement (TKR) surgery is routinely undertaken for “end stage” arthritis of the knee. The majority of surgeons perform TKR surgery with the aid of a tourniquet, which is an inflatable device placed around a patient’s thigh during the surgery. A tourniquet may however increase a patients’ risk of developing a blood clot within the leg (Deep Vein Thrombosis DVT), or if the clot travels to the lungs a pulmonary embolism (PE). DVT and PE are collectively known as venous thromboembolism (VTE)/Some surgeons believe that using a tourniquet helps the cement used in TKR surgery to bond more effectively and hold the knee replacement in place more effectively, but this is not supported by any good quality research evidence. The study will seek to estimate the relationship, if any, that tourniquet use has on the rates of post-operative death, VTE and revision surgery following TKR surgery up to 10 years after surgery.</p>
<p>Does laminar airflow make a difference to the infection rates for lower limb arthroplasty</p>	<p>Raj Shrivastava</p>	<p>Complete</p>	<p>William Harvey Hospital (East Kent)</p>	<p>External</p>	<p>Dec-15</p>	<p>Erratum to: Does laminar airflow make a difference to the infection rates for lower limb arthroplasty: a study using the National Joint Registry and local surgical site infection data for two hospitals with and without laminar airflow</p>	<p>Two hospitals in the same trust (and therefore serving similar population demographics) both undertaking joint replacements routinely were originally managed by two different trusts. Consequently the theatres of Hospital A have always had a laminar airflow (ultraclean vertical laminar airflow system) whereas the theatres in Hospital B have always had conventional ventilation systems. Hospital B without the laminar airflow is an outlier. Data from both hospitals have been routinely submitted to the National Joint Registry (NJR) since its inception. This study compares the revision rates for both infected total hip replacements and total knee replacements between the two hospitals and surgical site infection data.</p>

<p>ARGONAUT: Using electronic health records and distance recruitment to unravel the genetics of common disease</p>	<p>Mark Wilkinson</p>	<p>In progress</p>	<p>University of Sheffield and Wellcome Trust Sanger Institute</p>	<p>Internal</p>	<p>Sep-15</p>		<p>are 10 million people living with arthritis and the costs associated with the treatment and care of arthritis patients are over £8 billion per annum. We know that a person's risk of suffering OA is partly due to factors such as age, sex, and lifestyle. A large part of the risk is also inherited from our parents, and is in our genes (DNA). In this project we will use the power of the NJR to unravel which parts of the DNA code are responsible for the inherited part of knee OA. Using the NJR database, we will contact consented patients who have had a knee replacement for OA and invite them to participate in the study. Consenting patients will be sent a small kit to provide a sample of saliva (spit) that will be returned to the researchers. The researchers will then look at the DNA and compare it against the DNA of people without knee OA to see if there are differences. The researchers will also look to see if different patterns of knee OA have different genetic signatures,</p>
<p>Hip replacement in patients under 40: Trends, functional outcomes and survivorship in England and Wales'</p>	<p>Simon Jameson</p>	<p>In progress</p>	<p>Royal Devon and Exeter NHS Foundation Trust</p>	<p>Internal</p>	<p>Sep-15</p>		<p>Hip replacement in the very young is rare and little is described in the literature. For the surgeon presented with a young patient in whom a hip replacement is required, there is currently no evidence to support the use of one type of implant over another. Older patients tend to require hip replacement as a result of wear and tear arthritis. However, younger patients are more likely to have hip problems resulting from other causes, and the outcomes may vary. We propose to use nationally collected data to determine patterns of implant use, indications for surgery and functional outcomes. We also plan to assess how long implants survive in young patients. These findings will be compared to results following hip replacement in a 'normal' hip replacement population.</p>
<p>Failure rates of ceramic on ceramic bearings'</p>	<p>Peter Wall</p>	<p>In progress</p>	<p>University Hospital Coventry and Warwickshire</p>	<p>Internal</p>	<p>Apr-15</p>		<p>The use of ceramic bearing surfaces in total hip replacement is becoming increasingly utilised year on year. Failure of the bearing, mainly due to fracture, was seen in early generation ceramics – up to around 1.5% in some studies. Newer strengthened ceramics (3rd generation) are reported to have less problems, but the failure rate has not yet been quantified by large registry based studies. This study aims to quantify the risk level between the ceramics in current usage and to identify any factors that might lead to an increase in that risk.</p>
<p>Systemic effects of metal exposure after metal on metal hip resurfacing and replacement</p>	<p>Alister Hart</p>	<p>Complete</p>	<p>UCLH</p>	<p>Internal</p>	<p>Mar-15</p>		<p>One type of hip replacement (known as metal-on-metal) has been associated with high levels of metal particles in patients' blood. Some patients who have had a metal-on-metal hip report symptoms in various different parts of their body. This study will try to find out whether metal-on-metal hips in general are associated with these systemic problems. We plan to do this by joining together the following large databases which record information on hip implants, GP records, hospital admissions and causes of death.</p>

Outcomes following revision of non-metal-on-metal total hip replacements for adverse reactions to metal debris	David Murray	Complete	University of Oxford	External	Feb-15		While there is a clear short term benefit of THR in children, there is uncertainty about long term benefit. This research project will provide an effective summary of the evidence (and uncertainties) for current interventions to help patients, parents and clinicians to make the right decision about their hips.
Analysis of factors associated with intraoperative complications during shoulder replacement and their subsequent effects on revision rates and patient reported outcomes	Paul Cowling	Complete	University of York	External	Feb-15		<p>and revision shoulder replacement surgery is rare. There is little published information on what factors increase the risk of such complications, and whether these complications influence the outcome of shoulder replacement surgery.</p> <p>We aim to use the information collected by the National Joint Registry (NJR) to find out how often complications occur during shoulder replacement surgery, and to look for risk factors that may make these complications more likely to occur.</p> <p>We will analyse the information recorded on the NJR forms to determine whether patient factors like age, gender, general health and type of shoulder problem; or whether surgical factors like type of surgery, type of implant or surgical techniques used have an influence on the likelihood of complications occurring during surgery.</p> <p>We will also analyse patient reported outcomes in patients who</p>
NJR Special Project: Development of a personalised health forecasting tool for patients undergoing hip or knee replacement	Mark Wilkinson	In progress	University of Sheffield	Internal	Jan-15		<p>Many patients experience very good outcomes following joint replacement surgery, however there is great variability between individuals. For example, patient mortality, and prosthesis infection and loosening rates vary substantially depending on patient characteristics, surgical technique, and choice of prosthesis. Data from joint registries has quantified these risks at population level, but does not inform individual patient's decision making. In this project we will use the UK National Joint Registry dataset of 1.6 million surgical episodes to develop and validate a personalised decision aid to help patients considering joint replacement make evidence-based choices about their treatment.</p>
The choice between hip prosthetic bearing surfaces in total hip replacement: evidence synthesis, statistical analysis and decision modelling to evaluate the effectiveness and cost-effectiveness of prosthetic implants for the NHS.	Elsa Marques	Complete	University of Bristol	External	Jan-15	The choice between hip prosthetic bearing surfaces in total hip replacement: a protocol for a systematic review and network meta-analysis.	<p>We want to find out how effective each implant type is and which is the best implant for each patient given its cost to the NHS. To do so, we will analyse individual patient data from the National Joint Registry for England, Wales and Northern Ireland to estimate the likelihood of needing revision surgery for each implant combination in the short to medium term. In an economic model, we will then combine this information with other information from the medical literature to predict the long term likelihood of needing revision surgery, the costs of surgery and the quality of life of patients after surgery.</p>

NHS England/ US - NJR/ PROMs - using PROMs and NJR data to assess the impact of obesity on patient-reported outcomes for hip and knee replacements	Xanthe Hannah	Complete	NHS England	External	Jan-15	<p>set of variables. However, the PROMs data set and the Hospital Episodes Statistic (HES) to which it is linked do not include any variables that would provide information about a patient's weight. Therefore, it has not been possible to verify whether a patient's weight and/or them being obese does systematically affect patients' outcomes and, if required, control for this effect. This could represent a major limitation to the case-mix adjustment model currently in used and might affect the suitability of the current model:</p> <p>Therefore, it is proposed to use PROMs/HES and NJR data investigate whether patient outcomes are systematically affected by obesity. In practice, this would likely mean using NJR data to identify whether or not a patient was obese and test the effect of this on outcomes by including an obesity variable into the established random-effects regression model used to case-mix</p>
Development of efficient computer based solutions for data linkage, real time outcome assessment and surveillance in the UK National Joint Registry: a proof of concept study	Alex Macgregor	In progress	University of East Anglia	Internal	Jan-15	<p>Many patients experience very good outcomes following joint replacement surgery, however there is great variability between individuals. For example, patient mortality, and prosthesis infection and loosening rates vary substantially depending on patient characteristics, surgical technique, and choice of prosthesis. Data from joint registries has quantified these risks at population level, but does not inform individual patient's decision making. In this project we will use the UK National Joint Registry dataset of 1.6 million surgical episodes to develop and validate a personalised decision aid to help patients considering joint replacement make evidence-based choices about their treatment</p>
Post-surgical predictors of chronic pain after total knee replacement (STAR)	Andrew Judge	In progress	University of Oxford	Internal	Dec-14	<p>Many people with severe knee pain because of osteoarthritis have an operation called total knee replacement. Given the difficulties around pre-operative prediction, it is important to consider operative and post-operative factors that may be associated with chronic pain.</p>
Outcomes of constrained TKR in Primary and Revision situations	Victoria Gibbs	In progress	University Hospitals Warwickshire and Coventry	External	Nov-14	<p>The degree of stability in total knee replacement (TKR) is important; if the TKR is too unstable then the implant may fail, if the TKR is too rigid then premature loosening may occur. Constrained TKR help to withstand the forces about the knee. Determining the degree of constraint can be challenging and currently there is little evidence on outcomes. In this study, we aim to establish survival rate of primary and revision constrained TKR across age groups.</p>
UK Inflammatory Arthritis Arthroplasty Project: Set up phase	Alex Macgregor	In progress	University of East Anglia	Internal	Oct-14	<p>This project focuses on understanding the outcomes of joint replacement surgery in patients with an underlying diagnosis of inflammatory arthritis. We aim to establish the number of patients with inflammatory arthritis recorded on the national joint registry, their characteristics, and the type of joint replacement that they have.</p>

Best Practice in Total Hip Arthroplasty: Review of surgical practice based on the Standardised Revision Ratio (SRR).	Paul Baker	In progress	County Durham and Darlington NHS FT	Internal	Oct-14		Using current NJR data one can identify surgeons performing total hip replacement with a lower than expected rate of revision surgery (termed revision underliers). Many factors affect rates of revision within hip replacement surgery. Identifying the best techniques to reduce revision rates has yet to be fully established. Comparison of this low revision rate group against surgeons with a higher than expected revision rate could identify variation which might help explain the improved performance. Ultimately this could be used to disseminate recommendations to reduce hip arthroplasty revision rates.
Analysis of alternative bearings in Total Knee Replacement. A comparison of the revision rate with alternative surface bearings including highly cross linked polyethylene (HXLPE) and oxidised zirconium with cobalt chromium on conventional polyethylene	Thomas Partridge	In progress	Durham University	External	Oct-14		Over the last decade alternative bearings have become available for surgeons performing Total Knee Replacements (TKR). New bearings such as highly cross linked Polyethylene (HXLPE) and Oxidised Zirconium have yet to be fully analysed in comparison to conventional metal on standard polyethylene TKR using registry data. This study aims to establish the incidence of alternative knee bearings use in TKR and compare the revision rate with the current gold standard - cobalt chromium on conventional polyethylene.
Comparative Results of a New Crosslinked Annealed Polyethylene versus both Conventional Polyethylene and Ceramic Bearings in Hip Arthroplasty, Based upon a 45,877 Trident Acetabular Components Series.'	Jean Alain Epinette	Complete	Orthopaedic Research and Imaging Centre in Arthroplasty	External	Oct-14	Comparative Results From a National Joint Registry Hip Data Set of a New Cross-Linked Annealed Polyethylene vs Both Conventional Polyethylene and Ceramic Bearings	Wear and osteolytic responses to particles in Hip Arthroplasty with so-called "conventional" UHMWPE (PE) have led to wide spread use of ceramic-on-ceramic (CoC) bearings while highly cross-linked polyethylene materials (HXLPE) have demonstrated promising results. The goal of the current project was to compare the performance of a consecutive non selected cohort of patients implanted with the newest generation of annealed HXLPE acetabular bearings (X3) versus two consecutive non selected cohorts, one implanted with conventional polyethylene (N2vac), and one implanted with COC hip bearings (AL), all being matched with the same metallic shell.
Comparison of revision rates for taper-slip and composite beam cemented hip stems and HA-coated and non-HA-coated uncemented stems.	John Timperley	In progress	Princess Elizabeth Orthopaedic Centre, Royal Devon & Exeter Hospital	External	Oct-14	Kazi, H. A., Whitehouse, S. L., Howell, J. R., & Timperley, A. J. (2019). Not all cemented hips are the same: a register-based (NJR) comparison of taper-slip and composite beam femoral stems. Acta Orthopaedica, 1–13. https://doi.org/10.1080/17453674.2019.1582680	Revision after total hip replacement is often reported based on fixation method (cemented or uncemented). However, different types of prosthetic design mean that there are distinct subgroups within each of these types. We would like to further split the data to taper-slip and composite beam for cemented stems and HA-coated and non-HA-coated for uncemented stems and examine the revision rates for these subgroups.
Comparison of the cost-effectiveness of the most commonly used types and brands of prosthesis in total hip and knee replacement	Mark Pennington	Complete	LSHTM	External	Aug-14	1. Functional outcome, revision rates and mortality after primary total hip replacement – a national comparison of nine prosthesis brands in England.	The DH is collecting patient reported outcome data (PROMs) on every patient receiving a total hip or knee replacement in the English NHS. The CEU is commissioned by the DH to determine which type and brand of hip and knee prostheses offers best value for money. We have completed our comparison of the different types of hip prostheses. Now we need to extend our analysis to the comparison of different types of knee replacement (fixed vs mobile bearing) and a comparison of brands of hip and knee prostheses.

Total Hip Arthroplasty in the Young Adult: A National Joint Registry based analysis of implant usage.	Hiren Divecha	In progress	North West Deanery	External	Jul-14		Total hip replacement (THR) is an effective treatment for end-stage osteoarthritis. However, in young adults (under 50 years), consideration needs to be made for selection of implants that will survive and continue functioning well for as long as possible. The consequence of early implant loosening or wear is the need for revision THR. Implants are graded by the Orthopaedic Data Evaluation Panel (ODEP) according to published data on implant survival and the strength of this data. Our study aims to determine what implants are used in the UK in young adult THR and in particular, the strength of data supporting the prostheses being used.
Factors affecting mortality, morbidity and patient outcomes after joint replacement surgery	Adrian Sayers	In progress	University of Bristol	External	Jun-14		Understanding and accurately reporting the risks and benefits of joint replacement surgery using routinely collected data is very difficult. This project aims to improve the accuracy, reliability and interpretation of the statistics used to describe the differences in replacement joints, surgical approaches, surgeons and surgical units using data from the NJR. Using new statistical methodologies I will improve the ability of the NJR to identify high and low performing surgeons and surgical units, identify defective implants, and improve the communication of results to patients, surgeons, health care providers and commissioners.
Epidemiological analysis of the infecting organism in first time revision hip and knee replacements.	Paul Baker	Complete	Northern Deanery	External	Apr-14	1. Microorganisms responsible for knee infections	We intend to determine which organisms are causing infections within primary hip and knee replacements in England and Wales. All primary hip and knee replacements revised for infection before Dec 2013 (approx. 2500 hip and knee cases each) will be identified from the NJR dataset. These records will then be linked to the Health Protection Agency database using the NHS number to identify the infecting organism and any associated antibiotic sensitivities.
Explore the outcomes of total hip replacement (THR) in patients with Cerebral Palsy	Ashley Blom	Complete	University of Bristol	External	Apr-14		We propose to describe patterns in patients with Cerebral Palsy to see if there are any significant factors which lead to revision. We will achieve this by linking the National Joint Registry with the Hospital Episodes Statistics to find those with a recorded diagnosis of Cerebral Palsy and age and gender details.
The effect of femoral stem design on the incidence of periprosthetic fractures following primary total hip replacement	Jeya Palan	In progress	University of Oxford	External	Apr-14	The influence of cemented femoral stem choice on the incidence of revision for periprosthetic fracture after primary total hip arthroplasty; an analysis of national joint registry data. J Palan, MC Smith, P Gregg, S Mellon, A Kulkarni, K Tucker, AW Blom, DW Murray, H Pandit. Bone Joint J. 2016 Oct;98-B(10):1347-1354.	Although uncommon, a periprosthetic fracture after a total hip replacement is a devastating complication associated with an increased morbidity and mortality for patients. The incidence of periprosthetic fractures is increasing. The type of hip replacement being used may influence the risk of sustaining a periprosthetic fracture and it is unclear as to which design of femoral stem leads to a higher incidence of periprosthetic fracture. This study aims to identify any trends in patient demographics and incidence of periprosthetic fractures and if different implant designs, both cemented and uncemented, affect the incidence of periprosthetic fractures around the femoral stem.

Service Evaluation and Validation of the National Joint Registry Data on the Oxford Medial Compartment Unicompartmental Knee Replacement	David Murray	In progress	Nuffield Orthopaedic Centre, University of Oxford,	External	Mar-14		A service evaluation study using National Joint Registry data to identify the reasons for higher and lower than expected revision rates following unicompartmental knee replacements, using radiographic data.
An exploration of the association between high BMI and the incidence and prevalence of arthroplasty of the weight bearing joints'	Alex Macgregor	In progress	Norwich Medical School	External	Feb-14		The aim of this study is to investigate the association between high body mass index (BMI) and the rate of hip knee and ankle joint replacement surgery. Published NJR data has shown that the levels of obesity have been rising in recent years. This study will use comparative data from the UK population to establish whether this rise reflects a rise in BMI in the population, reflects a change in the rates of underlying OA, or reflects a changes in thresholds for surgery in patents who are overweight.
Revision of total hip arthroplasty: an analysis of a decade of NJR data (2003 to 2013)	Jeya Palan	In progress	NJR Research Fellow	External	Feb-14		As the number of primary total hip arthroplasty (THA) is set to increase by >170% in the USA by 2030, so is the number of revision THAs. It is estimated that the number of revision THAs will double by 2030. The Norwegian arthroplasty register found that the 10-year failure rate for revised prostheses was 26%. Using NJR data, the reasons for revisions, the types of revision systems being used and the type of component being revised will be analysed and the primary outcomes will be survivorship of the revised THR and mortality rate at 30 days and 90 days.
Infection after hip and knee replacement	Ashley Blom	In progress	University of Bristol	External	Sep-13	Moore AJ, Blom AW, Whitehouse MR, and Goberman-Hill R.	We propose to investigate the factors that might lead to infected hip and knee replacements and to identify the most effective ways to treat infected joint replacements. We will achieve this by linking the National Joint Registry with the Hospital Episodes Statistics. The linked datasets will provide extensive demographic data on the patients (such as age and gender), their illnesses (both severity and types of illnesses) and their treatment (such as one or two-stage revision).
An evaluation of constrained condylar revision knee systems used in England and Wales	Deiary Kader	In progress	Northumbria University	External	Sep-13		A study of various stemmed knee implants/ revision knee systems, also called constrained condylar knee (CCK).
Stem fracture following primary hip arthroplasty: comparison of different stems, stem lengths and fixation methods from Joint Registries in Australia, Sweden and UK.	John Timperley	In progress	Princess Elizabeth Orthopaedic Centre, Royal Devon & Exeter Hospital	External	Sep-13	Mortality following hip arthroplasty-inappropriate use of NJR data. S Whitehouse, B Bolland, J Howell, R Crawford, A Timperley. The Journal of Arthroplasty 16.04.14 J Arthroplasty. 2014 Sep;29(9):1827-34.	To determine the primary risk factors that influence the prevalence of femoral component fracture. Study of these factors may allow advice to be given with regard to type of fixation, size of implant and optimal surgical technique in order to reduce the prevalence of this complication in different groups of patients. Data from National Joint Registries in Australia and Sweden will also be utilised.
The epidemiological and financial burden of revision total knee arthroplasty in England Wales. Are current published US projections compatible?	Andrew Toms	In progress	Royal Devon and Exeter Hospitals HS trust	External	Sep-13	The Epidemiological and Financial Burden of Revision Total Knee and Hip Arthroplasty in England and Wales. A comparative analysis to U.S projections: A study using the NJR dataset. Toms, Andrew et al. BMJ. 2015 Mar 9;350:h756. doi: 10.1136/bmj.h756. Bone Joint J. 2015 Jan;97-B(1):10-8. doi: 10.1302/0301-620X.97B1.35279	Current projections estimate that the burden of revision total knee replacement will increase by 600% by 2030. This steady increase in total knee arthroplasty will un-doubtedly lead to an increase in revision surgery, postulated due to a number of factors. These include increase in life expectancy, climbing rates of obesity, and extension of surgical parameters in younger patients. We aim to quantify the current revision burden in England and Wales since the evolution of the joint registry by population age and sex and compile projections. This will be compared to U.S published projection data to determine whether the U.S experience is accurate and applicable in England and Wales.

NHS Reform and Private Healthcare Activity	Richard Disney	In progress	UCL, Institute for Fiscal Studies	External	Aug-13	New Joints: Private providers and rising demand in the English National Health Service.	This study will consider the relationships between NHS reforms and private-funded healthcare activity over the past decade. We will consider how volumes of NHS and privately funded hip and knee replacements have changed, and examine how these changes are related to policies such as waiting time targets and the use of private providers to treat NHS patients.
NJR extended PROMS	Alex Macgregor	In progress	University of East Anglia	Internal	Jul-13		all hip and knee joint replacement procedures conducted in England and Wales since 2002. Surgical outcomes are routinely assessed in the registry through linkage to major complications including the requirement for prosthesis revision and death. Since 2009, through a project independently funded by the Department of Health, these outcome data have been supplemented by data on patient-related outcome measures (PROMS) collected nationally from questionnaires administered to patients preoperatively and at 6 month postoperatively. This provides the ability to assess the determinants of a range of measures such as pain and disability that directly relate to the patient experience of surgery. However, it is recognized that the outcomes of surgery as perceived by patients continue to evolve over time and that the benefits and risks related to these procedures might not be captured fully by restricting follow up to in a six month time
A clinical evaluation to determine metal ion release from 4th generation metal on metal articulating surfaces in cementless total hip arthroplasty	Evert Smith	In progress	Avon Orthopaedic Centre	External	Jul-13		This Investigation is being conducted to investigate the extent of metal ion release and its incorporation into the surrounding tissue resulting from metal on metal articulating surfaces in cementless total hip arthroplasty. The ReCap / Magnum acetabular cup and femoral head used with the Taperloc femoral stem will be evaluated by clinical follow-up and the examination of retrieved components.
Polyethylene treatments and their effect on total hip replacement survival. Analysis of data from the National Joint Registry for England and Wales	Edward Davies	In progress	Royal Orthopaedic Hospital, Birmingham	External	May-13		New bearings that demonstrate favourable wear characteristics can potentially increase the life span of joint replacements. Debris from the plastic used in the bearing surface of early hip replacement implants was associated with loosening and the need for revision surgery. This led researchers to investigate alternative bearings and improve the characteristics of the commonly used plastic (polyethylene).
Registry-retrieval linkage study of 1000 metal-on-metal hip arthroplasties.	Alister Hart	In progress	UCL and RNOH	External	Apr-13	Are all metal on metal hip revision operations contributing to the National Joint Registry implant survival curves? A study comparing the London Implant Retrieval Centre and National Joint Registry datasets.	One of the most topical and controversial subjects in orthopaedics is the failure of metal-on-metal (MOM) hip arthroplasties (modular and resurfacing). The UK National Joint Registry (NJR) holds the world's largest database of primary and revision records of MOM hips and the London Implant Retrieval Centre (LIRC) holds the world's largest database of retrieved MOM hips. We would like to combine these two datasets and perform a detailed analysis of the failure mechanisms to better understand why they fail

Total hip replacement and surface replacement for the treatment of pain resulting from end stage arthritis of the hip (Review of technology appraisal guidance 2 and 44)	Aileen Clarke	Complete	University of Warwick	External	Dec-12	1. 'Setting benchmark revision rates for total hip replacement: analysis of registry evidence' – BMJ, Aileen Clarke, Warwick (Published 9 March 2015) BMJ 2015; doi: 10.3310/hta19100.	The aim of the review is to update the NICE Technology Appraisal Guidance documents 2 and 44. We will appraise the clinical and cost effectiveness of total hip replacement and surface replacement within their CE marked indications for the treatment of pain resulting from end stage arthritis of the hip. Total hip replacement will be compared with non-surgical management for arthritis of the hip.
Does the type of venous thromboembolism (VTE) chemoprophylaxis influence the rate of revision for infection following primary hip and knee replacement?	Paul Baker	In progress	Northern deanery	External	Dec-12	The effect of aspirin and low-molecular-weight heparin on venous thromboembolism after knee replacement: A non-randomised comparison using National Joint Registry Data Jameson SS, Baker PN, Charman SC, Deehan DJ, Reed MR, Gregg PJ, Van der Meulen JH	NICE recommends the use of potent anticoagulants for the prevention of venous thromboembolism following primary hip and knee replacement. While they are effective at reducing VTE events there is ongoing concern that these agents increase the risk of post-operative haematomas, wound discharge and the rates of infection following surgery. This projects aims to 1) Assess the temporal trends in the use of VTE chemoprophylaxis and the associated rates of revision for infection since 2003,
Revision rates by prosthesis type: parametric survival analysis to inform a model of cost-effectiveness	Vanessa Danielson	In progress	Johnson & Johnson Medical	External	Nov-12		Survival models of hip revision will be developed in order to inform a decision analytic model considering the cost-effectiveness of total hip replacement and total hip resurfacing as part of Johnson & Johnson Medical Ltd's submission to the National Institute for Health and Clinical Excellence (NICE) review of technology appraisal guidance 2 and 44. The analysis will conform to the guidelines outlined by the NICE Decision Support Unit.
Understanding failure in Unicompartmental knee arthroplasty	David Murray	In progress	University of Oxford	External	Nov-12	1. Patient reported outcomes following total and unicompartmental knee replacement: a study of 14,076 matched patients from the National Joint Registry for England and Wales. Published Bone Joint J. 2015 Jun;97-B(6):793-801. doi: 10.1302/0301-620X.97B6.35155.	Unicompartmental Knee Replacement (UKR) is an alternative to Total Knee Replacement (TKR) in osteoarthritis. It has advantages including faster recovery, lower mortality, lower cost and better outcomes in terms of pain, satisfaction and function. However, patients with UKR are around three times as likely to undergo revision surgery at ten years compared to those with TKR, which is unacceptably high. Identifying reasons behind this could improve decision-making and technique, allowing fewer revisions and better outcomes at lower cost. We will use NJR data alongside outcome data to identify predictors of failure such as patient selection, implant- and surgeon-related factors.
Rate of venous Thromboembolism in total ankle arthroplasty	Razi Zaidi	Complete	Royal National Orthopaedic Hospital NHS Trust, Stanmore	External	Jul-12	1. Pulmonary embolism and mortality following total ankle replacement: a data linkage study using the NJR dataset. R Zaidi, A Macgregor, S Cro, A Goldberg. BMJ Open Volume 6, Issue 6 2016;6:e011947. doi: 10.1136/bmjopen-2016-011947	Ankle joint replacement is an effective way to treat ankle arthritis. However there is very little known about the complications and outcomes in total ankle replacement. The NJR has been capturing ankle joint replacements for nearly 2 years. This study will look at ankle replacements on the NJR and determine what the rates DVT/PE. This will help us increase our knowledge base and best inform patients prior to surgery. Information will be disseminated through publication and through BOFAS (British Orthopaedic Foot and Ankle Society).

The risk of malignant disease following joint replacement	Justin Cobb	In progress	South West London Elective Orthopaedic Centre	External	Jun-12		<p>became popular in the decade 2000-2010 in the belief that it would avoid the complications associated with other implant materials. There is some concern that the use of metal on metal bearings during hip replacement surgery may increase the risk of cancer in these patients. Although we do not know the significance of this risk, there have been some small studies which have shown an increase in the incidence of cancer in patients with metal on metal implants. It is known that nanometer sized metal particles from metal on metal bearings are distributed throughout the body. Metal particles have been shown to induce cancer in animal models and may have an effect in humans if present in sufficient amounts for long periods. As patients are receiving these implants earlier in life, they are likely to be exposed to potential toxicity for longer.</p> <p>We propose to match data collected from the National Joint</p>
Bayesian methods in the evaluation of medical devices: the case of total hip replacement prostheses (THRP).	Cynthia Iglesias	In progress	University of York	External	Jan-12		<p>In the UK, the National Institute for Health and Clinical Excellence (NICE) has responsibility for recommending the adoption of healthcare treatments, based on clinical and cost effectiveness evidence. Innovative Bayesian statistical methods are increasingly being used by NICE to coherently bring together existing and newly acquired clinical and economic evidence. This project examines the potential of these methods to assist formal evaluation of medical devices (MDs) which can directly contribute to improve the healthcare of UK NHS patients.</p>
Relative revision rates by cement type in cemented and hybrid total hip replacement in England and Wales	Jason Webb	Complete	North Bristol NHS Trust	External	Dec-11		<p>One of the factors that may influence the survivorship of total hip replacement is the type of cement used to fix the hip replacement. Cement is used in both cemented (cement used on the cup and stem side) and hybrid (cement only used on the stem side) total hip replacement. We intend to use the data on primary (first operation) hip replacement and revision (second or later operation to replace a loose, worn out or otherwise failing hip replacement) to see if there is any difference in the rate of revision between types of cement.</p>
Using evidence to reduce risk of healthcare acquired infection following primary total hip replacement	Nicholas Graves	In progress	Queensland University of Technology	External	Nov-11		<p>This research will identify the best way to prevent healthcare-acquired infections among patients with total hip replacement. Modelling techniques will be used to examine the costs and benefits of increasing the scope and intensity of changing current infection-control arrangements. Because the NHS has scarce resources it is important to use them efficiently and changing infection control may improve efficiency. We will use existing data for this project and so the ethical risks are minor. The research team comprises health economists, statisticians, orthopaedic surgeons and infectious diseases doctors. Each member has specialist skills and a clearly defined role.</p>

Performance, regulation and competition in medical devices: a case-study on hip prostheses	Charlotte Davies	In progress	University of East Anglia	External	Oct-11		As part of my PhD I have linked the National Joint Registry to the Hospital Episode Statistics data-bases providing a unique and valuable resource of 188,000 observations for further detailed study to determine whether patients are receiving the best 'value-for-money' prostheses. In the proposed research I will address the following key issues: determinants of the cost of THR surgery and how this varies across patients, hospitals and prostheses; the impact of the introduction of 'Payment By Results' on the provision of hip prostheses; the prosthesis manufacturing industry and its relationship with the NHS, determining how patients receive the most appropriate prosthesis at the best price to the NHS.
True Mortality Rates after Total Hip Arthroplasty by method of fixation after adjustment for confounding factors- Results from the NJR in England & Wales	John Timperley	In progress	Royal Devon and Exeter NHS Trust	External	Sep-11		Currently mortality rates are reported by prosthesis group (ie cemented, uncemented, hybrid and resurfacing). However these are raw rates that do not account for potential confounding variables that may contribute bias to these rates. The aim of this study therefore is to determine the current trends in mortality rates by prosthetic group and compare them after adjustment for potential confounding variables including, age, gender, BMI,ASA, surgeon grade and provider type (public or private).
A retrospective cohort study comparing the relative risks of revision or mortality at one and five years in patients undergoing total hip replacement.	Richard Field	In progress	The Elective Orthopaedic Centre (EOC)	External	Aug-11		This study aims to compare the relative risks of death and revision between matched cohorts of patients undergoing four different types of hip replacement; cemented, standard hybrid, uncemented and resurfacing at one and five years. The patients will be matched for age, sex, BMI, Patient physical status and diagnosis.
Analysis of indication specific revision rate and predictive modelling for revision following primary knee arthroplasty'	Paul Baker	In progress	Northern Deanery	External	May-11		There are a number of different reasons why a knee replacement might fail and need revising. Previous work using NJR revision data has demonstrated that both the reason for revision and revision rate vary dependent upon a number of background factors (age, gender, prosthesis, time to failure etc). Prior analysis has focused upon revision for any cause as an endpoint when assessing revision rate. We intend to look at the rates of revision dependent upon the reasons for failure (eg revisions for infection, loosening or pain) and the impact that case mix variables have upon these revision rates using predictive modeling.
Orthopaedic Intervention in Rheumatoid Arthritis: A retrospective analysis of cumulative incidence, prognostic markers, outcomes and cost effectiveness over a 20 year period	Elena Nikiphorou	In progress	University College London	External	Mar-11	Predictors of length of hospital stay for RA-related orthopaedic intervention in 2 UK multi-centre inception cohorts (1986-1999 & 2002-2010).	Rheumatoid Arthritis (RA) is an auto-immune disease. Progressive disease can cause structural damage resulting in the need for joint replacement surgery. This is costly to the NHS service, but there is very little data on orthopaedic surgery rates and secular changes in RA. Over the last 20 years our group has been following a large group of patients with RA and monitoring how the disease develops over time. We are currently looking at the rate of orthopaedic surgery in these individual using the NJR records to obtain the most complete information available on procedures that have been undertaken. Our aim is to investigate the number, type and timing of orthopaedic procedures (especially joint replacement) over the last 25 years and examine any changes over time.

'PROMS following primary total knee replacement vs unicondylar knee replacement'	Paul Baker	Complete	Northern Deanery	External	Aug-10		Analysis of patient reported outcomes using the Oxford Knee Score and Euroqol in patients who have undergone primary elective knee replacement for osteoarthritis. Using Pre operative and 6 month post operative data we intend to compare the outcomes between those patients undergoing unicondylar knee replacement (UKR) compared to total knee replacement (TKR). Where differences exist we intend to investigate the reasons for this.
Analysis of Revision Knee Arthroplasty in England & Wales	Paul Baker	Complete	Northern Deanery	External	Aug-10		To analyse in detail the epidemiology of revision knee replacement in England and Wales. To establish who is undergoing revision knee surgery, why it is being done, and where and what surgery is being performed. To identify any differences in the epidemiology of revision of total knee replacement and unicondylar knee replacement.
Current trends in primary hip arthroplasty: Influence of these trends and associated factors on survival and revision rates.	John Timperley	Complete	Royal Devon and Exeter NHS Trust	External	Jun-10		To determine the current trends in primary hip arthroplasty within the UK and establish the effect of these trends on revision rates, focusing on type of prosthetic group (ie Cemented, uncemented, hybrid or resurfacing implants), indication for revision, age, gender, BMI, surgeon grade, implant type, bearing surface, head size and provider type (public or private).