Public & Patient Guide

to the NJR Annual Report 2012

Joint replacement information about:

Hips, knees and ankles

Hospitals

FAQs and latest research

Contacts and advice
Welcome to this Public and Patient Guide to the NJR Annual Report 2012

As joint replacement patients, we know how important it is to receive good quality information to help you understand more about your options and the treatment that has been recommended for you. That’s why the NJR has produced this patient guide to its main report.

Joint replacement is a highly successful operation that can bring relief from pain and improve mobility. However, going through the process can be baffling and many patients do not always understand their options or the detail of their treatment plan. There are also lots of variables that can affect the final outcome for each individual. We know that access to NJR data – including details of more than 1.3 million operations carried out since 2003 – can be a helpful tool for thought and discussion.

We hope this guide provides information to help you consider questions for your surgeon and healthcare team about the treatment and implant recommended for you.

The same is true for friends and family members who might be supporting you at this time. We hope you seek out support, or share this guide with others in order to get a better sense of how the information and data inside can help you.

Whatever the reason for your joint replacement, there are many others going through the same process, and it may help to know you are not alone. There is additional support out there for you on shared decision-making as well as advice on looking after yourself before and after surgery. We have listed some of the organisations that can help on page 38 of this guide.

The National Joint Registry doesn’t work in isolation – the information in this document is just one source that we hope will help you feel more confident in asking questions about your implant, your surgery and your recovery.

We will produce this guide each year, as the NJR continues to report on the growing number of joint replacement records it holds. Feedback is welcome at any time and you can contact NJR Communications on 020 7469 2500 or email: communications@hqip.org.uk.

We would like to extend particular thanks this year to our recently established NJR Patient Network, for their helpful thoughts, ideas and comments in shaping this guide.
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The charts used in this guide are taken from the full NJR Annual Report. The numbers relate to the full report only and do not run in sequence in this guide. Some have been amended to make them easier to read (identified by v2 in the title). The full report is available at www.njrcentre.org.uk
About the NJR

How does the NJR help patients?

We record information about joint replacement operations in England, Wales and (from early 2013) Northern Ireland in order to monitor the results of joint replacement surgery and protect patient safety. Using those records, we provide information and evidence to:

- Help surgeons choose the best artificial joints (implants) for patients
- Empower patients by helping them find out more about the implants available to them
- Improve patient safety by showing how well implants, surgeons and hospitals perform and take action where it is needed
- Give hospitals and implant manufacturers feedback about their performance to help them improve patient care
- If implant problems are found, help surgeons decide quickly whether patients need to come back to hospital

We currently collect information on hip, knee, ankle, elbow and shoulder procedures. Elbow and shoulder joint replacements have only been part of the registry since April 2012 so there was not any data available for 2011 and this year’s report.

What information is collected?

Your hospital will input specific details of your operation into the NJR such as the type of implant you received, which surgical technique was used, which side of your body the implant went into as well as your age and gender.

The NJR asks all patients to give their permission (consent) to have their personal details recorded with their operation details – this allows the NJR to be more effective in its role.

Why does the NJR need my personal details?

Your details allow the NJR to link you to the implant(s) you received during surgery. If for instance, you need another operation in the future, the NJR can measure the time between the operations. Adding together this time from all patients’ operations tells us how well different implants and surgeons are doing.

Without using personal details to link operations, the NJR cannot find out about problems with implants or surgeons.

The information we need from you is your name, date of birth, postcode and NHS or national patient number. Your personal information is kept confidential at all times and secure protocols are in place to ensure it is kept safe. It is not possible for anyone other than your surgeon to identify you as an individual. This also applies to information used in research and follow-up studies.

Giving your consent is voluntary but more than 9 out of 10 patients agree to have their details added to the NJR.

Do you only work in England and Wales?

We have collected data in England and Wales since 2003 and we are pleased to report that we will soon extend to Northern Ireland (from early 2013). In the future, our data collection may extend to the Isle of Man and the Channel Islands. Scotland has its own joint replacement registry.

The NJR, as the largest registry of its type in the world, is increasingly involved in international dialogue and collaboration. Our data is an important part of protecting patient safety here in England, Wales and Northern Ireland but our results and research activity can also offer and add value to the work that other registries are doing for example, in Sweden and Australia.

Who else do you share the data with?

There are lots of different ways we share and use the data, ensuring that clinical evidence is helping to inform clinical decisions and improve joint replacement
surgery. For example, surgeons, hospital management and manufacturers of implants can all use their own unique online system (via a secure log-in) designed to give them access to information that can inform and improve their work.

Security and confidentiality is always paramount and there are multiple safeguards in place to ensure that patient identities are protected. As a patient, if you gave consent to have your details added to the registry, you can request to see your records – only you and your surgeon have access to this information.

Is NJR information used for research?

Yes, we are pleased to have an active research policy and make data sets (chunks of data) available for specific research so that more can be learnt about implants, surgery and their results. These requests have to meet strict scientific, methodological and ethical criteria before any information is released.

An exciting part of this research programme is our extended Patient Reported Outcome Measures (PROMS) project in England. As part of the national PROMS programme, pre- and six month post-operative questionnaires, are sent to collect measurements of pain and physical function. This is to gain a better understanding of the patient’s experience of surgery and understand how much they have improved.

In addition we have now extended the programme and have surveyed a group of 50,000 hip and knee replacement patients at 12 months to assess those areas again and we intend to review this group of patients again at three years and five years after surgery. This will allow us to build up a very detailed picture of the factors that are most important in ensuring a successful surgical outcome from the patient’s perspective.

We hope to use some of the information for the first time in next year’s report (2013).

Please do take a look at our website at www.njrcentre.org.uk where our news and events page will give you some more information about our latest activities.

About joint replacement

What is a joint replacement?

A joint replacement, often referred to as a prosthesis (and sometimes simply as a ‘device’), is, in basic terms, an artificial implant that replaces a body joint, such as hip, knee or ankle (or an individual part of a joint) that is defective.

Joint replacements are nearly always carried out because of pain that cannot be controlled by other methods such as painkillers, physiotherapy or other surgery. The most common cause of pain is osteoarthritis. Patients receiving a partial hip replacement following a hip fracture are not recorded on the NJR but are recorded on a separate National Hip Fracture Database.

What healthcare staff will be involved with my treatment?

Once it has been suggested (commonly by your GP) that a joint replacement may be advisable, they may well refer you to a muscular skeletal clinic or another GP with a speciality in the area for further assessment.

If you are then referred to hospital you will see an orthopaedic surgeon or a member of his or her team. This may be followed by a pre-surgery assessment clinic where you may be seen by nurse practitioners. During your hospital stay, you might also see an occupational therapist or physiotherapist who would advise on after care.

All of these healthcare staff make up your healthcare or clinical team.

In 2011, osteoarthritis was recorded as the main indication for surgery in 93% of hip replacement patients, 98% of knee replacement patients and 88% of ankle replacement patients.
Do I have to have a joint replacement? Can I get a second opinion? What are the alternatives to surgery?

The final decision to have an operation or not remains with you the patient; it will be based on the risks and benefits of having a joint replacement or choosing not to (these choices should be made clear to you).

It may be that other options are available including, but not limited to, medication, physiotherapy, weight loss or other lifestyle changes. Regarding second opinions, meetings such as those outlined in the question above (muscular skeletal clinic referrals, hospital-based assessments) are designed to further analyse your GP’s initial diagnosis. If you are unsatisfied having met with your surgeon, you can return to your GP and ask to see a different surgeon.

What are the risks involved with having a joint replacement procedure?

The overall risk involved in joint replacement is very low. With any surgical procedure there is a small risk of medical complications such as heart attack, stroke and thrombosis. Infection is rare; rates are normally lower than 1%. Other surgical problems are also rare, but include dislocation, fracture, unequal length, nerve damage, pain and stiffness. Your surgeon will go through all of the risks before you sign a surgery consent form.

With time, some implants wear out or work loose and occasionally break, leading to the need for further replacement (revision) surgery. Some devices do fail more quickly or more frequently than others. Analysis of the performance of implants over time is included in the full NJR Annual Report (available free online) and some key findings are included in both the hip and knee sections of this guide.

What kind of prosthesis (implant, artificial joint) will be used? Do I have a choice?

There are several classes of prosthesis largely described by how they are constructed and the materials that make up their major components (for example, metal-on-polyethylene, metal-on-metal, ceramic-on-polyethylene, ceramic-on-ceramic).

As part of your assessments, the most suitable device for your individual situation will be established and you will be able to discuss this with your surgeon. The most regularly used devices and options are outlined in this guide.

How can I find out how many joint replacement procedures my local hospital carries out and the results of those operations?

For the first time this year, the NJR has published hospital-level information for hip and knee replacements as part of its full NJR Annual Report (page 173). It includes, for example, information on the number of procedures reported to the NJR in 2011 as well as number of consultants at the hospital and average patient age. This section also includes analysis of hospital data and assigns a red, amber or green rating as well as reports which hospitals were identified an outlier for revision rates.

A summary is included on page 34 of this guide.

My local hospital seems to have high rates for procedures such as revisions, should I be concerned?

Your GP and/or your clinical team should also be able to provide information as to the numbers and results of procedures carried out locally. Statistics such as the numbers of revisions carried out should not be taken as a guide as to the standards of a hospital. The fact that your local organisation carries out significant proportions of revisions could be attributable to a number of reasons, including that it could be a specialist centre in performing such surgery. If you have any doubts or questions though, speak with your GP or your clinical team.

Can I choose which hospital and surgeon perform the operation?

In principle, yes – as part of the NHS Choices initiative, patients do have the option in England to be referred to a specific hospital or surgical team (options may be more limited elsewhere). Of course each

Outlier analysis:
is a way of showing unusual differences in data that might indicate poor performance and the need for further investigation
individual case is unique, and the reasons for requesting a specific hospital do need to be justified, as do any costs and other implications associated with a request to be treated at a non-local hospital for instance. There may also be disadvantages in being a long distance from the hospital where your operation took place. You can discuss this in greater detail with your GP. The NHS is not able to provide a commitment that a specific surgeon will carry out your operation.

How do I find out how much experience my surgeon has?

This information is not in the public domain, so the simplest solution is to talk to your surgeon about their experience. Length of service or numbers of procedures carried out are not necessarily indicative of the standard of care you are likely to receive of course, but it is worth talking to your surgeon about your needs.

I find some of the language and terminology regarding joint replacement confusing. Is there somewhere that lists and explains the most commonly-used words and phrases?

Yes — this guide has been designed to help patients understand joint replacement procedures and some of the language that is used to describe them. Please see the Glossary on page 40 and Useful contacts and links on page 38 for more information.

There are also explanations of the most commonly used terms alongside the text and information in the annual report analysis for hips on page 10, knees on page 22 and ankles on page 32.

How does the NJR help me and inform future joint replacement surgery?

Your hospital should ask you to consent to your details being entered into NJR, and we recommend that you do. Please ask for the NJR consent form if it is not offered to you.

The registry now contains over 1.3 million hip, knee and ankle joint replacement procedures meaning it provides a unique source of information, the analysis of which ultimately means better care for you and other patients. Recording your procedure on the NJR can also speed up the process of reviewing patients in the rare event that a problem is found with a particular type of prosthesis.

An extended FAQs on joint replacement is available on our website at www.njrcentre.org.uk.

Who else provides information on joint replacement?

There are many organisations that provide additional general information about joint replacement, including specific guidance before and after surgery as well as online discussion forums. Please see page 38 for their contact details.
Summary of key facts 2011

Hips

- 80,314 replacement procedures recorded on NJR since April 2003
- 5% over 2010 (76,759)
- 60% age and gender largely unchanged to previous years
- Average age 67.2

Diagnosis
- 93% osteoarthritis
- Average BMI 28.5
- 'overweight'

What proportion were performed by the NHS?
- 69% Primary
- 82% Revision

Knees

- 84,653 replacement procedures recorded on NJR since April 2003
- 3.3% over 2010 (81,959)
- 56% age and gender largely unchanged to previous years
- Average age 67.4

Diagnosis
- 98% osteoarthritis
- Average BMI 30.8
- 'obese'

What proportion were performed by the NHS?
- 69% Primary
- 86% Revision

Ankles

- 492 replacement procedures recorded on NJR since April 2010
- 358 in 2010*
- 56% average age 68

Diagnosis
- 88% osteoarthritis
- Average BMI 29.6
- 'overweight'

What proportion were performed by the NHS?
- 75% Primary
- 66% Revision

*Compliance is currently 64% - not all of the procedures carried out in 2011 have been recorded on the NJR.
All patients are individuals and many have unique problems that require an operation to be tailored to their specific needs. If you have any questions about the hip type your surgeon is planning to use in your care, he or she would be happy to explain the reasons for choosing a particular implant.

**Introduction and x-rays**

To help you digest the information and analysis included in the public and patient guide, we have included an explanation of hip replacement.

Hip replacements are made up of a number of parts (components) which can be made of different materials and are, to some extent, variable enabling the surgeon to select a number of different combinations. There are always circumstances where a surgeon may choose to use a stem and cup of a specific type for individual clinical reasons. The main components are described below:

**Femoral stem**

This is seated in the top part of the femur (thigh bone) after removal of the patient’s existing femoral head. It may be cemented in place using bone cement. Alternatively, it may be uncemented and rely on a tight fit into the shaft of the femur initially and in some cases subsequent bone growth onto the surface of the implant – the implant may be specially coated to encourage this.

**Femoral head**

This is the ball that fits on the top of the femoral stem and articulates with the acetabular component (cup). It can be made of metal or ceramic and comes in a number of different sizes.

Earlier designs of hip replacement used femoral head size between 22.25mm and 32mm in diameter, more recently larger head sizes have become widely used, but not for long enough to know if they have any effect on the long-term outcome of total hip replacement.

**Acetabular component**

This is the cup or socket of the hip and there are two basic types. Cemented cups are made of ultra-high molecular weight polyethylene (a type of hard wearing plastic). This type have only undergone minor modification since the 1960s. They are fixed into the prepared acetabular socket with bone cement. Cementless cups generally have a metal shell with a back that encourages bone in-growth into it. They are fitted tightly into the prepared hip socket and the fixation may be reinforced with screws. A liner is then fixed into the shell. The liner may be plastic, ceramic, or metal.

**Resurfacing hip**

These use a conventional uncemented acetabular cup, but instead of the femoral head being removed, it is reshaped and a metal cap placed over it. Both components are made of metal. NJR data has confirmed other reports that in most patient groups they have an inferior performance to conventional hip replacement and they are now not recommended in older patients, women or smaller men because of high failure rates. Please see page 20 of this guide.
Bearing surfaces
The articulation between the femoral head (ball) and acetabular cup is known as the bearing surface. As with any two surfaces, repeatedly rubbing together the bearing surface is subject to wear and over time produces minute particles of debris. These particles can spread into the tissues immediately around the hip joint and this has been shown to have a major role in the loosening process of artificial hips.

Metal-on-plastic
The original hip had a metal head articulating with a plastic cup. This produces polythene debris but is still in widespread use and long-term studies suggest that it is suitable for older patients. Efforts to reduce debris production and therefore extend hip longevity have led to efforts to modify the bearing surfaces.

A new form of highly cross-linked polyethylene has better wear properties than standard polyethylene in testing. Studies to look at the wear rates of this when used in the acetabular cups of patients are encouraging, but it has not been in use for long enough to know if this will translate into hip replacements that last longer in patients.

Ceramic-on-plastic
The use of a ceramic head which is smoother and more resistant to scratching than a metal one has also been shown to reduce wear rates when used with polythene cups in testing and in clinical studies. Early results of this from the NJR are also encouraging but again there are no long-term studies to confirm that low wear translates into a hip replacement that lasts longer.

Ceramic-on-ceramic
In an effort to abolish the production of particles of polyethylene in hips alternative bearing surfaces have been used including metal-on-metal and ceramic-on-ceramic, where both head and cup are made of the same material.

Ceramic-on-ceramic bearings have only been in widespread use for less than 10 years and although early results are promising it is not yet known if this will result in longer lasting hip replacements.

Metal-on-metal
Metal-on-metal bearings became popular in the mid 2000s but the NJR identified very poor results for this type of implant. Their use has now largely been abandoned. Please see page 20 of this guide.

Hip replacement procedures in 2011
This section provides a summary, description and key observations for hip replacement procedures carried out between 1 January 2011 and 31 December 2011. It corresponds to the hip information found in Part Two of the full NJR Annual Report starting at page 62.

Operations carried out in England and Wales
In England and Wales, three types of organisations provide joint replacement surgery: NHS hospitals, independent hospitals (owned by a commercial company who treat mostly private patients but do treat NHS-funded patients) and independent sector treatment centres (a dedicated, privately-funded treatment centre for orthopaedics).

• The total number of hip replacement procedures entered into the NJR in 2011 was 80,314 – an increase of 5% compared to 2010
• A total of 71, 672 primary procedures were reported along with 8,641 revision procedures. The overall proportion of revision procedures compared to primary procedures is 11% — the same as 2010
The percentage of cemented and cementless procedures carried out has not changed significantly since 2010. However, the following changes can be noted:

- There has been an increase in the number of hybrid procedures, for example 85% used a cemented stem with a cementless socket and 15% used the reverse.
- There has been a significant decrease in the percentage of resurfacing and metal-on-metal stemmed procedures and where a large metal head is used (with a metal cup (head size equal to or greater than 36mm). The decline is thought to have resulted from the well-publicised withdrawal of one brand of device (ASR-DePuy). And, ongoing concerns for the safety of large head metal-on-metal and resurfacing procedures as a result of research by the NJR and others.

Types of implants used

Figure 2.3 below shows which types of implants were used in primary procedures in 2011:

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cemented</td>
<td>54%</td>
<td>46%</td>
<td>43%</td>
<td>38%</td>
<td>36%</td>
<td>36%</td>
<td>36%</td>
</tr>
<tr>
<td>Cementless</td>
<td>22%</td>
<td>25%</td>
<td>27%</td>
<td>32%</td>
<td>37%</td>
<td>41%</td>
<td>41%</td>
</tr>
<tr>
<td>Hybrid</td>
<td>12%</td>
<td>14%</td>
<td>14%</td>
<td>15%</td>
<td>15%</td>
<td>15%</td>
<td>17%</td>
</tr>
<tr>
<td>Resurfacing</td>
<td>9%</td>
<td>10%</td>
<td>9%</td>
<td>8%</td>
<td>6%</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>Large head metal-on-metal (≥36mm)</td>
<td>3%</td>
<td>6%</td>
<td>7%</td>
<td>8%</td>
<td>6%</td>
<td>5%</td>
<td>3%</td>
</tr>
<tr>
<td>Number of procedures</td>
<td>56,369</td>
<td>59,807</td>
<td>66,906</td>
<td>70,248</td>
<td>70,628</td>
<td>72,452</td>
<td>71,672</td>
</tr>
</tbody>
</table>

Patient characteristics

Age and gender

- On average, women were older than men at the time of their primary hip replacement – 68.6 years and 66.6 years respectively.
- Patients undergoing a resurfacing procedure were the youngest, at an average of 54.2 years.
- Five and a half times as many men have a resurfacing procedure compared with women.
- A patient’s age and gender influences the type of hip replacement carried out for example, in men and women under 70 years, a cementless procedure was more common whereas at more than 70 years, a cemented procedure was more common.
Patient health prior to surgery

ASA grades

In recent years, the proportion of patients to each grade has gone relatively unchanged for example, 15% were regarded as being fit and healthy prior to surgery compared to 16% in 2010.

In comparison to 2003 data however, when 37% were graded as being fit and healthy, there has been a steady decrease.

Data also suggests that the NHS is dealing with a higher proportion of the less fit patients, with 80% of patients graded as fit and healthy or with mild disease compared to 93% in the independent hospital and treatment centres.

Body Mass Index (BMI)

Average patient BMI, Figure 2.7, shows a corresponding trend:

- It has increased since 2004, from 27.4 to 28.6
- Women show a consistently lower BMI for total hip replacement procedures (the opposite can be seen for total knee replacements, page 25 of this guide)

Other data in the full report shows:

- There has been an increase in the proportion of patients who are obese, a BMI score 30 to 39 and
- A decrease in the proportion of patients with a normal BMI, between 20 and 24
Brands of implants used

In 2011, 119 brands of acetabular cups, 10 brands of resurfacing cups and 142 brands of femoral stems were used in primary and revision hip procedures on the NJR.

A full list can be found in the document ‘Prostheses used in hip, knee and ankles replacement 2011’ at www.njrcentre.org.uk. This document also includes analysis of implant use according to the current safety guidelines that apply to all implants on the market.

This section will show historical trends in the use of the most commonly used brands for cemented, cementless and resurfacing products. The 2011 Orthopaedic Data Evaluation Panel (ODEP) rating of these common implants are given in a table at the bottom of each chart in this section.

ODEP evaluates implants on the basis of data on clinical outcomes submitted by the manufacturers. Each implant is given a number (3, 5, 7 or 10) reflecting the number of years of follow-up of that implant and a letter A, B or C reflecting the quality of the follow-up data about the device. A 10A rated implant (the best rating) reflects good quality follow-up data for outcomes at a minimum of 10 years, while a 3C rating means 3 year follow-up data of inferior quality.

ODEP assess the outcome data based on the NICE advice that a primary hip implant should have a failure rate no worse than 10% at 10 years.

Further information can also be found in the full NJR Annual Report on page 76 which gives an additional introduction to the NICE guidelines and ODEP ratings.

Cemented hip stems brands

Figure 2.9 shows the Exeter V40 stem is the most used at 64% of the market share with the CPT second. There has been a corresponding decrease in the use of the Charnley cemented stems which now represents only 4% of the market.
Cemented hip cups brands

The significant change to note in Figure 2.10 is that an increasing proportion of surgeons using the Exeter V40 stem have chosen to use the Exeter Rimfit cup, rather than the Contemporary cup (both made by the same manufacturer to a similar design but the Rimfit cup is made of highly cross linked polyethylene).

![Figure 2.10](image)

**Figure 2.10**
Top five cemented hip cup brands, trends 2003 to 2011.

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of components used</td>
<td>15,148</td>
<td>25,299</td>
<td>27,690</td>
<td>25,491</td>
<td>26,884</td>
<td>25,151</td>
<td>23,811</td>
<td>23,783</td>
<td>24,349</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Brand name</th>
<th>Contemporary</th>
<th>Elite Plus Ogee</th>
<th>Elite Plus Cemented Cup</th>
<th>Marathon</th>
<th>Exeter Rimfit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODEP rating</td>
<td>5A</td>
<td>10A</td>
<td>10A</td>
<td>3A</td>
<td>No data has been submitted</td>
</tr>
</tbody>
</table>

Cementless hip stem brands

Figure 2.11 shows the Corail prosthesis is the most used brand in recent years.

![Figure 2.11](image)

**Figure 2.11**
Top five cementless hip stem brands, trends 2003 to 2011.

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of components used</td>
<td>4,461</td>
<td>10,766</td>
<td>15,134</td>
<td>18,457</td>
<td>23,439</td>
<td>29,200</td>
<td>32,129</td>
<td>34,560</td>
<td>33,724</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Brand name</th>
<th>Corail</th>
<th>Furlong HAC Stem</th>
<th>Accolade</th>
<th>Taperloc Cementless Stem</th>
<th>Versys Cementless Stem</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODEP rating</td>
<td>10A</td>
<td>10A</td>
<td>7B</td>
<td>10A</td>
<td>5A</td>
</tr>
</tbody>
</table>
Hips

Cementless hip cup brands

Figure 2.12 shows again that the trend for cementless hip cups reflects the popularity of the stem manufacturer. The Pinnacle cup is the most used despite losing some share of the market to the Exceed ABT cup.

![Figure 2.12](https://www.njrcentre.org.uk)

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
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</tr>
</thead>
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<td>24,068</td>
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<td>34,155</td>
<td>39,227</td>
<td>44,097</td>
<td>44,223</td>
</tr>
<tr>
<td>Brand name</td>
<td>Pinnacle</td>
<td>Trident</td>
<td>Trilogy</td>
<td>Exceed ABT</td>
<td>CSF Plus</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ODEP rating</td>
<td>7A</td>
<td>5A</td>
<td>7A</td>
<td>3A</td>
<td>Pre-entry</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Resurfacing head brands

The market share of the Birmingham Hip (BHR) has increased significantly in 2011, reflecting its performance when compared against other brands of its type. However it should be noted that this increase is against a background of significant decrease in the overall volume of resurfacing hip replacement procedures.

![Figure 2.13](https://www.njrcentre.org.uk)

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
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<td>Number of components used</td>
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<td>5,023</td>
<td>6,214</td>
<td>6,483</td>
<td>6,678</td>
<td>5,780</td>
<td>4,350</td>
<td>2,689</td>
<td>1,801</td>
</tr>
<tr>
<td>Brand name</td>
<td>BHR Resurfacing Head</td>
<td>Adept Resurfacing Head</td>
<td>Comet 2000 Resurfacing Head</td>
<td>Recap Resurfacing Head</td>
<td>Durom Resurfacing Head</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ODEP rating</td>
<td>10A</td>
<td>3A</td>
<td>5B</td>
<td>3A</td>
<td>No data has been submitted since 2004</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Bearing surfaces (hip articulation)

A notable observation for Figure 2.15 is the large rise in the use of ceramic-on-ceramic bearing, from low numbers in 2003 to nearly 17,000 in 2011. This growth appears to correspond with the decline in the use of metal-on-metal bearing surfaces. Again, see page 11 of this guide for a short explanation or page 20 for related research.

Revision procedures: When an implant is replaced

Patients undergoing a hip replacement procedure may need to have the replacement revised after a period of time due to loss of function or pain.

A total of 8,639 revision procedures were reported to the NJR, an increase of 787 compared to 2010.

Implant loosening (42%) and pain (24%) remain the most reported reasons for revision but numbers have decreased in comparison to 2010. Adverse soft tissue reaction was noted for 11% of all revision procedures with 5% reported in 2010 – highlighting the rise in revisions carried out in relation to the high failure rates of metal-on-metal hip replacements.

Infection as a reason for revision has increased to 12% of the total.

The full table of patient characteristics and reasons for revision can be found in the full NJR Annual Report on pages 82 and 83.

Treatment to prevent blood clots after surgery (Thromboprophylaxis)

The type of treatment offered to post-operative patients varies dependent on their risk factor for example, previous experience of a blood clot. There are two main types of thromboprophylaxis — chemical and mechanical. In 2011:

- The most frequently used chemical method was a low molecular weight form of the drug Heparin (also known as LWMH) at 71% of procedures
- The most frequently used mechanical method was TED (compression) stockings at 66% of procedures

The number of procedures where a chemical and mechanical method was used rose from 63% in 2007 to 90% in 2011. For more information please see the full NJR Annual Report on page 74.
How long artificial hips last: Implant survivorship 2003-2011

This analysis looks at implant survivorship using more than eight years of data kept on the NJR — how long the implant lasts until it needs to be revised for example, due to loss of function or pain.

The NJR looked at 458,568 records with patient-level information. It is important to note that the analysis of NJR data also takes into account the factors affecting implant performance for example, patient age and gender.

The information included here corresponds to the information found in the Part Three of the full NJR Annual Report starting at page 112, where further detail can be found. This includes notes about the methods and terms used.

Key findings

- **The practice of hip replacement has changed significantly since 2003.** Despite excellent survivorship, there has been a move away from cemented total hip replacement and an increase in cementless procedures – this trend appears to have stabilised this year.
- Ceramic-on-ceramic bearing surfaces are increasingly being used and patients tend to be younger. Analysis of early results show better survivorship as the head size increases.
- Cemented and hybrid fixation give very good survivorship up to eight years after implantation and the results for cementless fixation are only slightly worse in comparison.
- Metal-on-metal stemmed hip replacements show unacceptably high failure rates and survivorship is worse as the head size increases. Failure rates are highest for women.
- Resurfacing hip replacement has a much higher failure rate than cemented and cementless conventional hip replacement.

Data from the NJR suggests that cemented implants perform best at 8 years, and these are generally recommended in older patients (over 75 years) as the chances of their becoming loose before the patient dies are small.

In young patients (less than 55 years) the loosening rate of cemented acetabular cups is known from studies outside the NJR to accelerate after about 10 years. For this reason many surgeons choose to use uncemented cups (and implants) in this age group.

These are performing well in most cases at 8 years, but many of the uncemented implants currently in use have not been available for implantation for more than 10 years and so their long-term performance is not known.

For patients between 55 and 75 years surgeons have to make a judgement for each individual which type of implant to use. There are always circumstances where a surgeon may choose to use a stem and cup of a specific type for individual clinical reasons.

Risk of revision

The results in this section consider the first revision after primary hip replacement due to any reason.

- The lowest revision rates were associated with cemented metal- or ceramic-on-polyethylene implants.
- The difference between hybrid and cemented metal-on-polyethylene after eight years of implantation was not statistically significant (Figure 3.2).
- There were no statistically significant differences between the fixation methods for ceramic-on-polyethylene (Figure 3.3) although rates for uncemented fixation were slightly higher.
- Ceramic-on-ceramic revision rates were comparable to ceramic- and metal-on-polyethylene in many cases. For example, hybrid ceramic-on-ceramic has an eight year revision rate of 2% (Figure 3.4).
- Revision rates were significantly higher for metal-on-metal bearings and resurfacing (Figure 3.4).
- Although ceramic-on-metal has not been widely used, early results are not favourable with a three-year revision rate of 3%. This is significantly higher than for example, ceramic-on-polyethylene at 3 years (Figure 3.3).
95% confidence interval:
This indicates the 95% reliability of the estimates made by the NJR. There is an upper and lower boundary depicted by the shaded areas on the charts, which show the ‘goalposts’ of the confidence interval. Where there is a wide confidence interval (large shaded area), the reader should be aware that statistically, the estimates may not be as accurate as estimates made where there is thin (small shaded area) confidence interval.
More detailed tables are available in the full NJR Annual Report from page 121.

**Reasons for revision**

- Resurfacing procedures were more likely to be revised for pain, loosening and fracture than other types and stemmed metal-on-metal implants were more likely to be revised for pain, infection and loosening.
- Resurfacing and stemmed metal-on-metal implants were eight times more likely to be revised for pain than a cemented ceramic- or cemented metal-on-polyethylene implant.
- Ceramic-on-metal implants have higher revision rates due to loosening and pain.

Detailed tables are available in the full NJR Annual Report from page 125.

**Revision rates for main implant brands**

As described on page 14 of this guide, there are many different brands of implants stems and cups used in England and Wales and as a result, this gives a large number of stem and cup combinations.

In the full NJR Annual Report from the bottom of page 127, the most commonly used implant brand combinations have been grouped and show revision rates at one, three, five and seven years after implantation. Cemented stem and cups tended to have lower revision rates than hybrid and uncemented combinations but no substantive differences were seen.

The same analysis is also done for resurfacing brands.

There is also further analysis of five most used ‘stem and cup brand’ combinations where again, there were few significant differences, the exception being the metal-on-metal Corail Pinnacle which is doing less well at 5 years after implantation. This detail can be found on page 129 to 130 of the full NJR Annual Report.

**Special topic studies: Metal-on-metal hip replacements**

The NJR Editorial Board selects a special topic for further analysis as part of the annual report and analysis process. The special topic is chosen to focus on an important issue or emerging trend of interest to the joint replacement community – in this case, metal-on-metal hip replacements.
In this part of the guide, we include a short summary of three research papers published in 2012 as part of the special topic work looking at metal-on-metal hip replacements in 2011-12.

Further reading and data from the first two papers can be found in the full NJR Annual Report on page 135.

1. In-depth analysis into the survivorship of stemmed metal-on-metal hip replacements: Published in The Lancet (March 2012)

Key findings from the research paper:
- Stemmed MoM implants failed at much higher rates than other bearing types
- Use of these implants peaked in 2008, almost entirely due to use of larger femoral head sizes and has declined sharply since that time
- Stemmed MoM implants showed high failure rates in all groups of patients but were more likely to fail for women and for younger patients. For example, in comparison to other bearing surfaces (e.g. ceramic-on-ceramic) women were up to four times more likely to need a revision procedure
- The use of larger MoM head sizes corresponded with an increased risk of failure for example, for a sixty-year old man, a 28mm head had a 5-year revision rate of 3.2% compared to 5.1% for a 52mm head size. By contrast, ceramic-on-ceramic bearings did better with larger head sizes

The summary (abstract) for this paper is available at: http://www.thelancet.com/journals/lancet/article/PIIS0140-6736%2812%2960353-5/abstract

2. Risk of cancer in first seven years after metal-on-metal hip replacement compared with other bearings and general population: Published at bmj.com (British Medical Journal, April 2012)

Key findings from the research paper:
- Resurfacing in women had a much higher failure rate than conventional hip replacement and should no longer be implanted, irrespective of resurfacing head size
- Predicted 5-year revision rates in 55-year-old women were 8.3% with a 42mm resurfacing head, 6.1% with a 46mm resurfacing head compared to 1.5% with a 28mm cemented metal-on-polyethylene stemmed total hip replacement
- In men with smaller femoral heads, resurfacing resulted in poor implant survival. Predicted 5-year revision rates in 55-year-old men were 4.1% with a 46mm resurfacing head, 2.6% with a 54mm resurfacing head, and 1.9% with a 28mm cemented metal-on-polyethylene stemmed total hip replacement
- Hip resurfacing only resulted in similar implant survivorship to other surgical options in men with a large femoral head and preoperative measurement should used to assess suitability in men for this type of procedure

The summary (abstract) for this paper is available at the link: http://www.thelancet.com/journals/lancet/article/PIIS0140-6736%2812%2960989-1/abstract
Introduction and x-rays

To help you digest the data and analysis included in this section, we have included an explanation of knee replacement below.

Almost all total knee replacements use a metal femoral component which is fixed to and curves around the bottom end of the thigh bone (femur). This moves against a polyethylene (hard-wearing plastic) tray.

This tray is normally attached to a metal tibial component at the top of the shin bone (tibia) but can be fixed directly to the shin bone. A tibial component will have a stem going into the shin bone to provide additional stability.

Implants can be cemented (fixed with bone cement) or cementless (without bone cement). In a hybrid fixation, the femoral component is fixed with cement and the tibial component is fixed without cement.

Implant types

Bicondylar or total condylar knee replacement: an implant attached to both parts of the shin bone and thigh bone. A knee cap replacement (patella) is often used as well.

Unicondylar: an implant attached to only one part of the shin bone and one part of the thigh bone, sometimes described as a partial knee replacement.

Patello-femoral: a two-piece knee implant that provides a joint between the knee cap (patella) and thigh bone. The patella component is made of hard-wearing plastic.

Implant stability levels

With knee replacement procedures, different implant types offer different implant constraints. This is the level of stability offered by the implant and the best option for a patient will be determined by their needs in consultation with the surgeon — instability is a reason for failure of knee implants.

The following types of constraint (stability levels) are analysed by the NJR.

Unconstrained: the artificial components making up the knee joint are not linked to each other and have no stability built in. It relies on the patient’s soft tissue, ligaments and muscles for stability.

Posterior-stabilised: some stability is built in and in these designs, the cushion of the plastic tray component fixed to the shin bone has a raised surface with an internal post that fits into a special bar (called a cam) in the femoral (thigh bone) component. The pieces work together to provide additional stability to the knee as it bends and straightens.
**Constrained condylar or hinged/linked:** where the components fitted to the thigh and shin bone are attached with a hinge type mechanism. This is used when a patient's knee is highly unstable and the soft tissue and ligaments would not be able to support other types of replacement for example, in severely damaged knees or where a very elderly patient is undergoing a revision replacement.

This type of joint will have greater limitations on the range of movement and is not expected to last as long as other types. It requires more invasive surgery to put in place larger stems into the thigh and shin bone and also puts additional stress on the bones.

**Bearing surfaces**

When a knee joint is replaced, the ends of the bones are replaced with metal and a plastic tray is placed between them. Two types of bearing joint are analysed by the NJR.

**Fixed:** the plastic tray component fixed to the shin bone is attached firmly to the metal part beneath. The metal femoral component, attached to the thigh bone, rolls on this cushioned surface. This type of bearing may reduce the level of pain experienced following the procedure but in some cases, excessive activity or weight gain can cause a fixed bearing to wear down more quickly.

**Mobile:** the plastic tray is less fixed to the metal part beneath, it is more mobile and requires support from the soft tissues around the joint. This allows it to rotate short distances. It may allow more movement but there is a possibility of dislocation.

**Operations carried out in England and Wales**

Three types of organisations provide joint replacement surgery: NHS hospitals, independent hospitals (owned by a commercial company who treat mostly private patients but do treat NHS-funded patients) and independent sector treatment centres (a dedicated, privately-funded treatment centre for orthopaedics).

- The total number of knee replacement procedures entered into the NJR in 2011 was 84,653 – an increase of 3.3% compared to 2010
- A total of 79,516 primary procedures were reported along with 5,137 revision procedures

**Types of implants used**

Of the 79,516 primary knee replacement procedures performed in 2011:
- 91% were bicondylar procedures (total knee replacement)
- 8% were unicondylar procedures (partial knee replacement)
- 1% were patello-femoral replacements

These proportions have largely remained the same when compared to previous years. However the following trends can be noted:

- There has been a slight increase in cemented total knee replacement over the past three years when compared to cementless total knee replacement. See below, Figure 2.17
- The use of unconstrained fixed implants has increased gradually over the past five years. This corresponds to a decline in the number of unconstrained mobile implants. Please see Figure 2.18

**Primary procedure:** The first time a total joint replacement is carried out on any individual joint in a patient

**Revision procedure:** An operation, following the primary procedure, to remove and replace one or more parts of the total joint replacement normally due to loss of function or pain

**Knee replacement procedures in 2011**

This section provides a summary, description and key observations for knee replacement procedures carried out between 1 January 2011 and 31 December 2011.

It corresponds to the information found in Part Two of the full NJR Annual Report starting at page 86.
The total number of procedures for 2011 shows an apparent decrease but not all procedures performed in 2011 were entered before the deadline of 28 February 2012.

Unicondylar and patello-femoral replacements are generally used in younger patients as the procedures conserve more bone and allow greater scope for successful revision surgery later on.
Patient characteristics

Age and gender

- The average age for knee replacement surgery was 67.4 years.
- Approximately 56% of patients were women.
- On average, women were a similar age to men at the time of their primary knee replacement – 68.11 years and 68.12 years respectively.
- Patients undergoing a patello-femoral replacement were the youngest, at 60.5 years and 75% were women.
- Women were on average, older than men for cemented, cementless and hybrid procedures but younger for patello-femoral and unicompartmental procedures.

Patient health prior to surgery

ASA grades

In recent years, the proportion of patients to each grade has gone relatively unchanged for example, 11% were regarded as being fit and healthy prior to surgery compared to 12% in 2010.

In comparison to 2003 data however, when 31% were graded as being fit and healthy, there has been a steady decrease.

Body Mass Index (BMI)

Looking at Figure 2.22, average patient BMI shows a corresponding trend:

- It has increased since 2004, from 29.25 to 30.82.
- Women show a consistently higher BMI for knee replacement procedures (the opposite can be seen for hip replacements, page 13 of this guide).

Other data in the report shows that:

- There has been an increase in the proportion of patients who are obese, a BMI score 30 to 39.
- A decrease in the proportion of patients with a normal BMI, between 20 and 24.

Brands of implants used

In 2011, 52 brands of total condylar knee prostheses were used in primary knee procedures and 32 used in revision procedures. In addition, there were 15 brands of unicompartmental prostheses, 6 brands of patello-femoral replacements and 15 brands of hinged knees. The number of brands for each prosthesis type is similar to 2010.

A full list can be found in the document ‘Prostheses used in hip, knee and ankles replacement 2011’ at www.njrcentre.org.uk.
From 2013, the Orthopaedic Data Evaluation Panel (see page 15) will start evaluating knee replacement implants based on clinical evidence submitted by the manufacturers and award a rating. A similar process is already in place for hip replacements and you can read more on page 14 of this guide for more information.

This section will show historical trends in the use of the most commonly used brands for primary condylar, unicompartmental, patellofemoral and fixed hinge knee brands.

Further information can also be found in the full NJR Annual Report from page 100.

**Total condylar knee brands**

Figure 2.24 shows that PFC Sigma knee is currently the most-used brand for primary total knee replacements.

---

**Figure 2.22 v2**

Average BMI for primary knee replacement patients between 2004 and 2011.

![Figure 2.22 v2](image)

**Figure 2.24 v2**

Top five total condylar knee brands, trends 2003 to 2011.

![Figure 2.24 v2](image)

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Components used</td>
<td>21,624</td>
<td>40,837</td>
<td>53,519</td>
<td>54,755</td>
<td>64,624</td>
<td>65,232</td>
<td>69,255</td>
<td>71,217</td>
<td>70,451</td>
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</table>

<table>
<thead>
<tr>
<th>Brand name</th>
<th>PFC Sigma</th>
<th>Nexgen</th>
<th>Triathlon</th>
<th>Genesis 2</th>
<th>AGC</th>
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</thead>
<tbody>
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<td>Numbers used in 2011 (out of a total of 70,451)</td>
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<td>9,644</td>
<td>7,422</td>
<td>6,775</td>
<td>6,049</td>
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</tbody>
</table>
All patients are individuals and many have unique problems that require an operation to be tailored to their specific needs. If you have any questions about the knee type your surgeon is planning to use in your care, he or she would be happy to explain the reasons for choosing a particular implant.

Unicondylar knee brands

Figure 2.25 shows the Oxford Partial Knee is the most used brand in recent years. New to the market in 2007, the Sigma HP has had increased use and is the second most used brand for primary unicondylar knee replacement (also known as partial knee replacement).

### Figure 2.25 v2

Top five unicondylar knee brands, trends 2003 to 2011.

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of components used</td>
<td>2,226</td>
<td>4,256</td>
<td>5,428</td>
<td>5,740</td>
<td>6,640</td>
<td>7,069</td>
<td>7,146</td>
<td>7,407</td>
<td>6,811</td>
</tr>
<tr>
<td>Brand name</td>
<td>Oxford Partial Knee</td>
<td>AMC/Uniglide</td>
<td>Sigma HP</td>
<td>Triathlon Uni</td>
<td>Zimmer Uni</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Numbers used in 2011 (out of a total of 6,811)</td>
<td>4,648</td>
<td>314</td>
<td>871</td>
<td>100</td>
<td>639</td>
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</tbody>
</table>

Patello-femoral knee brands

Figure 2.26 shows a more even spread between the brands used for primary patello-femoral replacements in 2011.

### Figure 2.26 v2


<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
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<td>Number of components used</td>
<td>267</td>
<td>503</td>
<td>672</td>
<td>727</td>
<td>1,016</td>
<td>1,152</td>
<td>1,199</td>
<td>1,248</td>
<td>1,212</td>
</tr>
<tr>
<td>Brand name</td>
<td>Avon</td>
<td>FPV</td>
<td>Sigma HP</td>
<td>Journey PFJ</td>
<td>Zimmer PFJ</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Numbers used in 2011 (out of a total of 1,212)</td>
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<td>226</td>
<td>212</td>
<td>195</td>
<td>163</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Knees

Revision procedures: When an implant is replaced

Patients undergoing a knee replacement procedure may need to have the replacement revised after a period of time due to loss of function or pain.

A total of 5,135 revision procedures were reported to the NJR, an increase of 1% compared to 2010.

• Implant loosening (42%) and pain (20%) remain the most reported reason for single-stage revision procedures but infection (82%) was the commonest reason for two-stage revision procedures.

The full table of patient characteristics and reasons for revision can be found in the full NJR Annual Report on page 102 to 104.

Treatment to prevent blood clots after surgery (Thromboprophylaxis)

The type of treatment offered to post-operative patients varies dependent on their risk factor for example, previous experience of a blood clot. There are two main types of thromboprophylaxis — chemical and mechanical. In 2011:

• The most frequently used chemical method was the drug Heparin (also known as LWMH) at 70% of procedures.
• The most frequently used mechanical method was TED (compression) stockings at 69% of procedures.

The number of procedures where a chemical and mechanical method was used rose from 49% in 2004 to 90% in 2011. For more information please see the full NJR Annual Report on page 98.

Fixed hinged knee brands

Figure 2.27 again shows a more even spread between the brands used for primary fixed hinged knee replacements in 2011.

![Figure 2.27](image-url)

Top five fixed hinged knee brands, trends 2003 to 2011.

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of components used</td>
<td>70</td>
<td>129</td>
<td>195</td>
<td>212</td>
<td>269</td>
<td>284</td>
<td>310</td>
<td>304</td>
<td>280</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Brand name</th>
<th>Endo Rotating Hinge</th>
<th>MTH</th>
<th>Nexgen Hinge Type</th>
<th>RT-Plus</th>
<th>Smiles Knee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numbers used in 2011 (out of a total of 280)</td>
<td>91</td>
<td>28</td>
<td>38</td>
<td>30</td>
<td>35</td>
</tr>
</tbody>
</table>
How long artificial knees last: Implant survivorship 2003-2011

This section looks at the analysis of implant survivorship at more than eight years of data kept on the NJR that is, how long the implant lasts until it needs to be revised for example, due to loss of function or pain.

The NJR looked at 499,695 records with patient-level information. It is important to note that the analysis of NJR data also takes into account the factors affecting implant performance for example, patient age and gender.

The information included here corresponds to the information found in Part Three of the full NJR Annual Report starting at page 156, where further detail can be found. This includes notes about the methods and terms used.

Key findings

- The practice of knee replacement has changed little since 2003. The majority of procedures are cemented fixed bearing total knee replacements
- Total knee replacement gives good implant survivorship regardless of fixation, constraint or bearing (fixed or mobile)
- The implant survivorship for unicondylar and patello-femoral joint replacement is worse and these types of implant were normally revised for pain. These implants were also more commonly used on younger patients

Implant type and bearing surface

- A variety of knee replacement implants are used because of various types of fixation, constraint and bearings available
- Some types are less commonly used for example:
  - 43% of surgeons have never performed a unicondylar knee replacement and 70% had never performed patello-femoral knee replacements
  - The majority of surgeons did not use uncemented (73%) or hybrid fixation (70%)
  - For cemented knee replacement, the most common fixation, most surgeons had never used unconstrained (64%) or posterior-stabilised (85%) designs

Table 3.15 below shows the trends for fixation, constraint and bearing between 2003 and 2011.

Table 3.15 Trends in use of fixation and constraint 2003 to 2011.

<table>
<thead>
<tr>
<th>Fixation/Constraint/Bearings</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>All cemented</td>
<td>81.5</td>
<td>80.9</td>
<td>81.8</td>
<td>81.4</td>
<td>82.0</td>
<td>81.9</td>
<td>82.7</td>
<td>84.1</td>
<td>85.8</td>
</tr>
<tr>
<td>Cemented, unconstrained, fixed</td>
<td>53.6</td>
<td>53.2</td>
<td>53.5</td>
<td>51.3</td>
<td>51.4</td>
<td>52.2</td>
<td>53.8</td>
<td>55.5</td>
<td>58.1</td>
</tr>
<tr>
<td>Cemented, unconstrained, mobile</td>
<td>4.0</td>
<td>4.2</td>
<td>5.2</td>
<td>6.3</td>
<td>6.3</td>
<td>5.6</td>
<td>4.6</td>
<td>3.9</td>
<td>2.9</td>
</tr>
<tr>
<td>Cemented, posterior-stabilised, fixed</td>
<td>20.7</td>
<td>20.6</td>
<td>19.7</td>
<td>20.0</td>
<td>20.5</td>
<td>21.0</td>
<td>21.4</td>
<td>21.8</td>
<td>21.6</td>
</tr>
<tr>
<td>Cemented, posterior-stabilised, mobile</td>
<td>0.9</td>
<td>1.1</td>
<td>1.6</td>
<td>1.9</td>
<td>1.7</td>
<td>1.4</td>
<td>1.4</td>
<td>1.4</td>
<td>1.3</td>
</tr>
<tr>
<td>All uncemented</td>
<td>6.7</td>
<td>6.6</td>
<td>6.2</td>
<td>6.5</td>
<td>6.5</td>
<td>6.2</td>
<td>5.2</td>
<td>4.6</td>
<td>3.8</td>
</tr>
<tr>
<td>All hybrid</td>
<td>2.6</td>
<td>2.8</td>
<td>2.4</td>
<td>2.4</td>
<td>1.8</td>
<td>1.4</td>
<td>1.4</td>
<td>1.2</td>
<td>0.6</td>
</tr>
<tr>
<td>Uncemented/hybrid, unconstrained, fixed</td>
<td>4.9</td>
<td>4.8</td>
<td>4.3</td>
<td>4.0</td>
<td>4.1</td>
<td>3.9</td>
<td>3.7</td>
<td>2.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Uncemented/hybrid, unconstrained, mobile</td>
<td>3.5</td>
<td>3.7</td>
<td>3.3</td>
<td>3.2</td>
<td>3.1</td>
<td>3.1</td>
<td>2.7</td>
<td>2.6</td>
<td>2.3</td>
</tr>
<tr>
<td>All unicondylar</td>
<td>8.0</td>
<td>8.7</td>
<td>8.6</td>
<td>9.2</td>
<td>8.8</td>
<td>9.1</td>
<td>9.0</td>
<td>8.9</td>
<td>8.4</td>
</tr>
<tr>
<td>Unicondylar, fixed</td>
<td>1.4</td>
<td>1.8</td>
<td>2.1</td>
<td>2.3</td>
<td>2.0</td>
<td>2.1</td>
<td>2.3</td>
<td>2.6</td>
<td>2.5</td>
</tr>
<tr>
<td>Unicondylar, mobile</td>
<td>6.4</td>
<td>6.7</td>
<td>6.5</td>
<td>6.8</td>
<td>6.7</td>
<td>6.8</td>
<td>6.6</td>
<td>6.2</td>
<td>5.8</td>
</tr>
<tr>
<td>All patello-femoral</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.1</td>
<td>1.4</td>
<td>1.5</td>
<td>1.5</td>
<td>1.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Other/unknown</td>
<td>3.6</td>
<td>2.9</td>
<td>2.8</td>
<td>3.1</td>
<td>2.8</td>
<td>2.4</td>
<td>2.0</td>
<td>1.9</td>
<td>1.9</td>
</tr>
<tr>
<td>Base</td>
<td>13,448</td>
<td>27,470</td>
<td>41,560</td>
<td>49,188</td>
<td>66,138</td>
<td>73,510</td>
<td>75,062</td>
<td>77,383</td>
<td>75,894</td>
</tr>
</tbody>
</table>

Unicondylar and patello-femoral replacements are generally used in younger patients and the joint is expected to need revision surgery within ten years. As the procedure conserves more bone, it allows greater scope for a better outcome for patients later on in life.
Risk of revision

The results in this section consider the first revision after primary knee replacement due to any reason.

- The lowest revision rates for total knee replacements were for cemented unconstrained fixed bearings at 2.8%
- Differences in revision rates between all types were statistically small, please see Figure 3.7 below.
- Revision rates were considerably higher for unicondylar knee replacements at 10.8% and for patello-femoral knee replacements at 14.7%. See Figure 3.6 below. More detailed tables are available in the full NJR Annual Report on pages 160 and 161.

95% confidence interval:
This indicates the 95% reliability of the estimates made by the NJR. There is an upper and lower boundary depicted by the shaded areas on the charts, which show the ‘goalposts’ of the confidence interval. Where there is a wide confidence interval (large shaded area), the reader should be aware that statistically, the estimates may not be as accurate as estimates made where there is thin (small shaded area) confidence interval.
Reasons for revision

• For cemented total knee replacements, there were few significant differences for reasons for revision across all the constraint and bearing types.

• Unicondylar knee replacements were around five times more likely to be revised for pain than cemented total knee replacements for four times more likely to be revised for loosening.

• Patello-femoral knee replacements were also primarily revised for pain and were more than six times more likely to be revised than cemented knee replacements.

Detailed tables are available in the full NJR Annual Report on pages 164 and 165.

Revision rates for main implant brands

• Revision rates for total knee replacement brands were lowest for the MRK and Triathlon brands although the most used brand, the PFC Sigma was not much higher. There were not vast differences between any of the brands analysed, detailed in the NJR Annual Report on page 166.

• For patello-femoral knee replacements, the most used brand Avon had lower than average revision rates, 10.4% at seven years after implantation compared to the overall 11.8%.

• Revision rates varied for unicondylar brands and the lowest were associated with the MG Uni.

There were large enough numbers to look at six different brands for comparisons between constraint and bearing type. There were some observations made but these differences were overall, not large.

This detail can be found on page 129 to 130 of the full NJR Annual Report.
Introduction and x-rays

To help assist patients in digesting the data and analysis included in this section, we have included an explanation of general orthopaedic terms for ankle replacement.

Ankle replacements are less common in comparison to hip and knee replacements and are more complex, as the joint sits upon a mobile foot which moves in multiple directions. It is also put under high loads, often several times body weight. In addition, ankle arthritis is less common that hip or knee arthritis.

The ankle is a complex joint made up of the tibia (main shin bone), the fibula (the bone that runs down the outside of the leg), and the talus, which is the bone deep inside the ankle, which sits between the tibia and the heel bone and connects the leg to the foot.

An artificial ankle replacement in the UK tends to be made up of three parts (components). Two of the parts cover the bones that form the joint, and in between is a third, mobile plastic component (meniscal component).

Tibiotalar component

The tibial component covers the top part of the ankle joint – the bottom of the tibia (main shin bone). It is either a flat or curved tray and is fixed to the bone with either a short stem or small pegs.

Talar component

This covers the lower half of the ankle joint (talus). It is normally curved and fixed into place using pegs.

Meniscal component

The mobile component is made of ultra-high molecular weight polyethylene (hard wearing plastic) and sits between the talar and tibial components and moves forwards and backwards slightly during ankle motion. In some designs of ankle replacement the plastic component is not mobile but instead is fixed to the tibial component (fixed component designs).

Ankle replacement implants must be aligned properly in order to function correctly and additional procedures may be required for example, realignment surgery to ensure your heel is under your knee or soft tissue surgery to establish the right range of motion of the joint.

Ankle replacement procedures 2011

The NJR started recording ankle joint replacement information in April 2010.

This is the first complete year of ankle data entered onto the NJR and further information can be found pages 105 to 111 of the full NJR Annual Report.

Operations carried out in England and Wales

Three types of organisations provide joint replacement surgery: NHS hospitals, independent hospitals (owned by a commercial company who treat mostly

Ankles

Your surgeon will be able to discuss with you whether any additional procedures will be needed at the time of the operation.
private patients but do treat NHS-funded patients) and independent sector treatment centres (a dedicated, privately-funded treatment centre for orthopaedics).

- The total number of ankle replacement procedures entered into the NJR was 492
- A total of 471 primary procedures were reported along with 21 revision procedures

**Types of implants used**
- Nearly all of the procedures were uncemented. Cement is only occasional used where bone stock is poor, mainly in revision cases

**Patient characteristics**
- The average age for women was 62.7 years
- The average age for men was 68.6 years
- 56% of patients were male
- The main indication for surgery was osteoarthritis in 88% of patients. Of these patients, 19% had history of previous fracture. Most of the cases of osteoarthritis will be post-traumatic but the NJR does not have a breakdown of cases that had injury without a fracture, for example, a severe ankle sprain

**Patient health prior to surgery**

The average **Body Mass Index (BMI)** was 29.6 ‘overweight’ which is higher than for primary hip procedures but lower than primary knee procedures.

**Surgical techniques**

During a primary ankle replacement, other ankle related procedures may be performed. In 2011, this happened in 28% of procedures and 9% accounted for Achilles tendon lengthening. See page 109 in the full NJR Annual Report for more information.

**Brands of implants used**

The DePuy mobility ankle prosthesis was used in 57% of all primary procedures in 2011. The next most commonly used was Corin’s Zenith in 22% of cases.

More information on other brands can be found in the document ‘Prostheses used in hip, knee and ankles replacement 2011’ at www.njrcentre.org.uk.

**Revision procedures: When an implant is replaced**

Patients undergoing an ankle replacement procedure may need to have the replacement revised after a period of time due to loss of function or pain.

Of the 21 revision procedures performed, the average age for a patient was 66.7 years.

- 33% of revisions were for implant loosening
- 24% due to malalignment and
- 29% due to pain

**Treatment to prevent blood clots after surgery (Thromboprophylaxis)**

The type of treatment offered to post-operative patients varies dependent on their risk factor for example, previous experience of a blood clot. There are two main types of thromboprophylaxis — chemical and mechanical. In 2011:

- The most frequently used chemical method was the drug Heparin (also known as LWMH) at 74% of procedures
- The most frequently used mechanical method was TED (compression) stockings at 59% of procedures

The number of procedures where a chemical and mechanical method was used was 76%.

---

**BMI:**

A statistical tool to estimate a healthy body weight based on an individual’s height. A score of **20-24** is normal, **25-29** is overweight, **30-39** is obese and **40+** morbidly obese
Introducing hip and knee information by hospital in England and Wales 2011

Part Four of the full NJR Annual Report looks at how individual hospital units in England and Wales have performed against a range of key measures (quality indicators). This table, listed alphabetically, is available on page 179 of the full NJR Annual Report and will give you an idea of how your local provider performed against these measures.

Hospital-level data has been included for the first time this year and is part of the NJR’s response to the Government’s transparency agenda which aims to make more information from clinical audit and registries available to patients and the public. The feedback is also sent directly to hospitals who should be using the results to look at those areas where investigation or improvement may be needed.

The information in this section is a summary of those hospitals who were identified as an outlier for revision rates.

Outliers for hip and knee revision rates

What is an outlier?

Outlier analysis aims to identify ‘unusual differences’ in data from ‘normal variations’ which may indicate the need for further investigation. An outlier would be identified for showing unusually poor performance.

For revision rates, an outlier will be a hospital with an unusually high proportion of revision rates – more than would normally be expected.

The NJR can work out who is an outlier by plotting the revision rate data onto a funnel plot. These funnel plots can be seen on page 176-177 of the main Annual Report.

Using this format allows hospitals of different sizes to be compared and adjustments are also made for patient characteristics that affect revision rates for example, age group and gender. For knee units, adjustment is also made for partial knee replacements.

Hospitals carrying out hip replacements with outlier revision rates

• Llandough Hospital
• University Hospital Of Hartlepool
• University Hospital Of North Tees
• Rotherham District General Hospital
• Sussex Orthopaedic NHS Treatment Centre
• Nuffield Health Tees Hospital
• Clifton Park NHS Treatment Centre
• Spire Cardiff Hospital

You may have already read in this guide that metal-on-metal implants are associated with higher revision rates than other bearing surfaces (for example, ceramic or plastic). Many of the outlying hip units, above, have more commonly used stemmed metal-on-metal and resurfacing procedures since 2003. This information can be seen in Table 4.1 (opposite page) and may explain their higher revision rates.

Hospitals carrying out knee replacements with outlier revision rates

• Spire Alexandra Hospital

Your local hospital should be able to explain why they have been identified as an outlier and what steps they might have taken to look at the reasons why it might be the case. Also to note when a revision operation is carried out by a hospital that did not do the primary procedure, it is always matched to the hospital who did the first operation.

The NJR shares outlier information with the regulator for hospitals, the Care Quality Commission for England and the Welsh Government for Wales. They use this information as part of their assessment of hospital performance against national standards for care.

The NJR shares outlier information with the regulator for hospitals, the Care Quality Commission for England and the Welsh Government for Wales. They use this information as part of their assessment of hospital performance against national standards for care.
Performance against quality indicators

In Part Four of the full NJR report the registry has also awarded a green, amber or red rating to reflect how well hospitals are performing based on consent, compliance and linkability. The details below explain why these quality indicators are important for the NJR's work.

Compliance
Participation in the NJR is mandatory so all operations that take place in a given year should be recorded in the NJR. This will maximise NJR data quality and ensure that the NJR can report on the ‘full’ picture of what is happening at any individual NHS Trust or Health Board.

Consent
Consent rate is the percentage of records submitted to the NJR with patient consent confirmed.

Patient consent, to record name/date of birth/postcode/NHS number against operation details is vital for the NJR to be able to link primary and revision operations together. Measuring the time in between operations, for all patients, tells us how well different implants and surgeons are performing.

Linkability
Linking operations together on the database is done through NHS number. Linkability rate refers to the proportion of operations submitted with both patient consent and the NHS numbers. This is vital so that the NJR is able to link primary and revision operations together.

The NJR has also listed the following information for each hospital in 2011:

- Number of consultants
- Average ASA grade (patient health prior to surgery)
- Percentage of male patients
- Average age at operation
- Percentage of 10A rated acetabular hip implants
- Percentage of 10A rated femoral hip implants

Table 4.1 Use of metal-on-metal bearing surfaces in outlying hip units 2003 to 2011.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Stemmed metal-on-metal</th>
<th>Resurfacing</th>
<th>All metal-on-metal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clifton Park NHS Treatment Centre</td>
<td>18.1%</td>
<td>3.7%</td>
<td>21.8%</td>
</tr>
<tr>
<td>Llandough Hospital</td>
<td>35.2%</td>
<td>4.0%</td>
<td>39.3%</td>
</tr>
<tr>
<td>Nuffield Health Tees Hospital</td>
<td>23.0%</td>
<td>24.8%</td>
<td>47.8%</td>
</tr>
<tr>
<td>Rotherham District General Hospital</td>
<td>37.2%</td>
<td>6.1%</td>
<td>43.3%</td>
</tr>
<tr>
<td>Spire Cardiff Hospital</td>
<td>41.6%</td>
<td>10.4%</td>
<td>52.1%</td>
</tr>
<tr>
<td>Sussex Orthopaedic NHS Treatment Centre</td>
<td>28.4%</td>
<td>4.4%</td>
<td>32.9%</td>
</tr>
<tr>
<td>University Hospital Of Hartlepool</td>
<td>17.4%</td>
<td>9.4%</td>
<td>26.8%</td>
</tr>
<tr>
<td>University Hospital Of North Tees</td>
<td>42.2%</td>
<td>24.3%</td>
<td>66.5%</td>
</tr>
<tr>
<td>Average across all hip units</td>
<td>7.2%</td>
<td>7.2%</td>
<td>14.4%</td>
</tr>
</tbody>
</table>

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All hospitals should ask patients whether they wish to consent to have their details added to the NJR and ensure the responses are recorded on the NJR database.

10A is the highest rating awarded by ODEP for evidence about an implant on the market. You can read about ODEP ratings on page 14 of this guide.
Please use this area to make notes and questions, either for your surgeon or for the clinical team at the hospital where you or a family member will be treated.

Some commonly asked questions are also listed below, which you may find useful.

What type of implant are you recommending?

What are the pros and cons of this implant?

What type of surgical technique would be used?
What are the pros and cons of this option?

What other options are available to me?

How should I prepare before surgery?

What do I need to know about my aftercare?
Useful contacts and information

Age UK
www.ageuk.org.uk
0800 169 6565

Alkaptonuria Society
www.alkaptonuria.info
01223 322897

Arthritis Care
www.arthritiscare.org.uk
020 7380 6500

Arthritis and Musculoskeletal Alliance
www.arma.uk.net
020 7842 0910/11

Arthritis Research UK
www.arthritisresearchuk.org
0300 790 0400

British Association for Surgery of the Knee
www.baskonline.com
Contact via website

British Hip Society
www.britishhipsociety.com
020 7406 1756

British Orthopaedic Association
www.boa.ac.uk
020 7405 6507

British Orthopaedic Foot and Ankle Society
www.bofas.org.uk
Contact via website

Carers UK
www.carersuk.org
0808 808 7777

CHARGE Family Support Group
www.chargesyndrome.org.uk
020 8265 3604

Equalities National Council
www.encweb.org.uk
020 7474 9812

Healthcare Quality Improvement Partnership
www.hqip.org.uk
020 7469 2522

Health & Care Professions Council
www.hpc-uk.org
0845 300 6184

Health Talk Online
www.healthtalkonline.org
01865 201330

Independent Age
www.independentage.org
0845 262 1863
National Association of Patient Participation
www.napp.org.uk
01932 242350

National Hip Fracture Database
www.nhfd.co.uk
0207 251 8868

National Joint Registry
www.njrcentre.org.uk
0845 345 9991

National Osteoporosis Society
www.nos.org.uk

National Rheumatoid Arthritis Society
www.nras.org.uk
0800 298 7650

National Voices
www.nationalvoices.org.uk
020 3176 0738

NHS Choices
www.nhs.uk

NHS Improvement Enhanced Recovery
www.improvement.nhs.uk/enhancedrecovery
See ‘publications’ for the leaflet ‘My role and responsibilities in helping to improve my recovery’

Older People’s Advocacy Alliance
www.opaal.org.uk
01782 844036

The Patients Association
www.patients-association.com
0845 608 4455

Patient Concern
www.patientconcern.org.uk
Email only: patientconcern@hotmail.com

The Patients Forum
www.patient.co.uk
Contact via website only

Patient Opinion
www.patientopinion.org.uk
0800 122 3135

Sickle Cell Society
www.sicklecellsociety.org
020 8961 7795

Strongbones Children’s Charitable Trust
www.strongbones.org.uk
01708 750599
# Glossary

The information in this glossary intends to help you understand some of the technical data and terms that are used in this guide.

## A

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetabular component</td>
<td>The portion of a total hip replacement prosthesis that is inserted into the acetabulum – the socket part of a ball and socket joint</td>
</tr>
<tr>
<td>ASA grades</td>
<td>American Society of Anaesthesiology 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 – not expected to survive 24 hours</td>
</tr>
</tbody>
</table>

## B

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bearings</td>
<td>The two surfaces that articulate together in a joint replacement. Options include metal-on-polyethylene, metal-on-metal, ceramic-on-polyethylene and ceramic-on-ceramic</td>
</tr>
<tr>
<td>Bicondylar implant (knee)</td>
<td>See total knee replacement</td>
</tr>
<tr>
<td>BMI</td>
<td>Body Mass Index. A statistical tool used to estimate a healthy body weight based on an individual’s height.</td>
</tr>
<tr>
<td>Brand (of prosthesis)</td>
<td>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</td>
</tr>
</tbody>
</table>

## C

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>CQC</td>
<td>Care Quality Commission. This organisation regulates the care provided by the NHS, private and voluntary organisations in England</td>
</tr>
<tr>
<td>Cement</td>
<td>The material used to fix cemented joint replacements to bone</td>
</tr>
<tr>
<td>Cemented</td>
<td>Implants designed to be fixed into the bone using cement</td>
</tr>
<tr>
<td>Cementless</td>
<td>Implants designed to be fixed into the bone in the long term by the patient’s own bone growing into or onto the implant</td>
</tr>
<tr>
<td>Compliance</td>
<td>The percentage of all total joint procedures, which were performed in an individual unit, that have been entered into the NJR within any given period</td>
</tr>
<tr>
<td>Component</td>
<td>A part or section of the implant used in the joint replacement</td>
</tr>
<tr>
<td>Constrained condylar implant (knee)</td>
<td>Components fitted to the thigh and shin bone are attached with hinge-like joint</td>
</tr>
<tr>
<td>Cross-linked polyethylene</td>
<td>A type of hard-wearing plastic used in the production of joint replacement implants</td>
</tr>
<tr>
<td>Cup (hip)</td>
<td>The artificial part replacement for the hip socket. See acetabular component</td>
</tr>
</tbody>
</table>

## F

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Femoral</td>
<td>Relating to the femur (thigh bone)</td>
</tr>
<tr>
<td>Femoral component (hip)</td>
<td>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)</td>
</tr>
<tr>
<td>Femoral component (knee)</td>
<td>Portion of a knee prosthesis that is used to replace the articulating surface of the femur (thigh bone)</td>
</tr>
<tr>
<td>Femoral head</td>
<td>The top circular section of the artificial hip replacement</td>
</tr>
</tbody>
</table>

## H

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>HES</td>
<td>Hospital Episode Statistics. Data on the types of cases, procedures, length of stay and other hospital statistics collected routinely by NHS hospitals in England</td>
</tr>
<tr>
<td>Hybrid procedure</td>
<td>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)</td>
</tr>
<tr>
<td>HQIP</td>
<td>Healthcare Quality Improvement Partnership</td>
</tr>
<tr>
<td><strong>Indication (for surgery)</strong></td>
<td>The reason for surgery i.e. osteoarthritis or pain. The NJR system allows for more than one indication to be recorded</td>
</tr>
<tr>
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</tr>
<tr>
<td><strong>Linkability</strong></td>
<td>The proportion of operations submitted to the NJR with both patient consent and the NHS number</td>
</tr>
<tr>
<td><strong>LHMoM</strong></td>
<td>Large head metal on metal. Large femoral head normally used with a resurfacing cup</td>
</tr>
<tr>
<td><strong>LMWH</strong></td>
<td>Low molecular weight heparin a medicine used in the treatment of Thromboprophylaxis</td>
</tr>
<tr>
<td><strong>Malalignment</strong></td>
<td>The incorrect alignment of joint replacement components</td>
</tr>
<tr>
<td><strong>Meniscal implant (ankle)</strong></td>
<td>Mobile plastic component that sits between the talar and tibial components in a total ankle replacement</td>
</tr>
<tr>
<td><strong>Metal ions (Chromium and Cobalt)</strong></td>
<td>Particles of metal from worn joint replacements that can be detected in the blood stream. Elevated levels can be an early indication of a failing metal-on-metal joint replacement</td>
</tr>
<tr>
<td><strong>MHRA</strong></td>
<td>Medicines and Healthcare products Regulatory Agency. This Government agency monitors medicines and medical devices work and are acceptably safe</td>
</tr>
<tr>
<td><strong>MoM</strong></td>
<td>Metal-on-metal. A bearing surface in which both articulating surfaces are made of metal, usually cobalt-chrome alloy</td>
</tr>
<tr>
<td><strong>NHS</strong></td>
<td>National Health Service</td>
</tr>
<tr>
<td><strong>NICE</strong></td>
<td>National Institute for Health and Clinical Excellence</td>
</tr>
<tr>
<td><strong>NJR</strong></td>
<td>National Joint Registry for England and Wales</td>
</tr>
<tr>
<td><strong>Osteoarthritis</strong></td>
<td>The most common form of arthritis leading to the need for a joint replacement</td>
</tr>
<tr>
<td><strong>Patello-femoral implant (knee)</strong></td>
<td>A two-piece knee implant that provides a joint between the knee cap (patella) and thigh bone</td>
</tr>
<tr>
<td><strong>Patient consent</strong></td>
<td>Where a patient consents to have their personal details added to the NJR. Consent rate is the percentage of records submitted to the NJR with patient consent confirmed</td>
</tr>
<tr>
<td><strong>PEDW</strong></td>
<td>Patient Episode Database Wales, the Welsh equivalent to Hospital Episode Statistics (HES) in England</td>
</tr>
<tr>
<td><strong>Primary hip/knee/ankle replacement</strong></td>
<td>The first time a total joint replacement operation is performed on any individual joint in a patient</td>
</tr>
<tr>
<td><strong>Prosthesis</strong></td>
<td>Orthopaedic implant used in joint replacement procedures, e.g. a total hip or a unicondylar knee</td>
</tr>
<tr>
<td><strong>Resurfacing (hip)</strong></td>
<td>A type of hip replacement in which the covering of the femoral head and socket are resurfaced, with metal implants</td>
</tr>
<tr>
<td><strong>Revision hip/knee replacement</strong></td>
<td>Operation performed to remove and replace one or more components of a total joint prosthesis for whatever reason</td>
</tr>
<tr>
<td><strong>Survivorship analysis</strong></td>
<td>A statistical method that is used to determine what fraction of a population, such as those who have had a particular hip implant, has survived unrevised past a certain time</td>
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</tr>
<tr>
<td>Talar component (ankle)</td>
<td>Portion of an ankle prosthesis that is used to replace the articulating surface of the talus at the ankle joint</td>
</tr>
<tr>
<td>TAR (ankle)</td>
<td>Portion of a knee prosthesis that is used to replace the surface of the joint where the ends of the bone meet the tibia (shin bone) and the knee joint</td>
</tr>
<tr>
<td>Tibial</td>
<td>Relating to the tibia (shin bone)</td>
</tr>
<tr>
<td>Tibial component (knee)</td>
<td>Portion of a knee prosthesis that is used to replace the surface of the joint where the ends of the bone meet the tibia (shin bone) and the knee joint</td>
</tr>
<tr>
<td>Tibial component (ankle)</td>
<td>Portion of an ankle prosthesis that is used to replace the surface of the joint where the ends of the bone meet the tibia (shin bone) at the ankle joint</td>
</tr>
<tr>
<td>THR</td>
<td>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</td>
</tr>
<tr>
<td>Thromboprophylaxis</td>
<td>Chemical or mechanical post-operative regime prescribed to patients with the aim of preventing blood clot formation</td>
</tr>
<tr>
<td>TKR (knee)</td>
<td>Total knee replacement (total knee arthroplasty). Replacement of both tibial and femoral condyles, with or without resurfacing of the patella and with or without cement</td>
</tr>
<tr>
<td>Total ankle replacement</td>
<td>Total ankle replacement (total ankle arthroplasty). Replacement of both tibial and talar surfaces, with or without cement</td>
</tr>
<tr>
<td>Total hip replacement</td>
<td>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</td>
</tr>
<tr>
<td>Total knee replacement</td>
<td>Total knee replacement (total knee arthroplasty). Replacement of both tibial and femoral surfaces, with or without replacement of the knee cap (patella) and with or without cement</td>
</tr>
<tr>
<td>Treatment centre</td>
<td>Treatment centres are dedicated units that offer elective and short stay surgery and diagnostic procedures in specialities such as ophthalmology, orthopaedic and other conditions. These include hip, knee and ankle replacements. Treatment centres may be NHS (NHS treatment centre) or privately funded (independent sector treatment centre – ISTC)</td>
</tr>
<tr>
<td>Type (of prosthesis)</td>
<td>Type of prosthesis is the generic description of a prosthesis, e.g. modular cemented stem (hip), patello-femoral joint (knee)</td>
</tr>
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<tr>
<td>Uncemented</td>
<td>See cementless</td>
</tr>
<tr>
<td>Unconstrained implant (knee)</td>
<td>Artificial components making up the knee joint are not linked to each other and have no stability built in. It relies on the patient’s soft tissue, ligaments and muscles for stability</td>
</tr>
<tr>
<td>Unicondylar implant (knee)</td>
<td>Implant attached to only one part of the shin bone and one part of the thigh bone, sometimes described as a partial knee replacement</td>
</tr>
</tbody>
</table>
NJR Annual Report 2012: Public & Patient Guide

This Public & Patient Guide to the National Joint Registry’s 2012 Annual Report was written and prepared by:

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* The full report was prepared by a team overseen by the NJR Management team based at the Healthcare Quality Improvement Partnership (HQIP) and the NJR Editorial Board.

The full report is available as a free download from the NJR website at www.njrcentre.org.uk and www.hqip.org.uk.

Every effort was made at the time of publication to ensure that the information contained in this report was accurate. If amendments or corrections are required after publication, they will be published on the NJR website at www.njrcentre.org.uk where the document is available to download in PDF format.

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