

The Non-Arthroplasty Hip Registry 2016 Annual Report



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1 Introduction

This, the first Annual Report of the Non-Arthroplasty Registry (NAHR), represents the first few years of data recorded since its creation in 2012. There is still a large amount of work to be done to improve data accuracy and surgeon engagement. The Executive of the British Hip Society (BHS) together with the NAHR User Group (set up to administer the Register) will continue to develop and improve datasets and the user interface, with the aim of establishing this registry as the best of its kind in the world.

Over the past 15 years there has been a significant increase in the number of hip-preservation operations performed. However, many have little or no long-term outcome data, and what evidence is in the literature is often Level Four, with small numbers and limited follow-up. Over the same period the power of arthroplasty registries to promote change and improve patient safety has become well defined. Although randomised control studies comparing some non-arthroplasty hip surgery with non-operative management are under way, the final outcomes of these studies are not yet available.

The UK Non-Arthroplasty Hip Registry is a national register designed to collect data for all operations on or around the hip, except those involving either arthroplasty or the treatment of acute fractures. Operations which are included cover a wide range, from those in the paediatric population through to hip-preservation techniques, such as hip arthroscopy and osteotomy, used in adults. The success of the NAHR depends on gathering as much information as possible on all patients having these operations, and cases from both the NHS and the independent health care sector are included.

The creation of the NAHR was unanimously supported by the Membership of the BHS at the Annual General Meeting in Torquay (March 2011) and subsequently launched at the 2012 Meeting in Manchester. The development of the NAHR has at all times been an open process and all BHS members are encouraged to contribute and comment on any aspect of the project.

Clinicians can use the NAHR to collect and display comprehensive outcome data on all their patients using various outcome measures. The information sheet, consent form and minimum dataset version 1.1, which can be [downloaded here](#)¹, are designed to reflect the familiar format of the National Joint Registry (NJR) forms. They contain a basic mandatory dataset as well as an enhanced dataset for surgeons to record additional surgical findings.

The NAHR is the world's only registry of its kind and, together with the British Orthopaedic Association (BOA) Quality Outcomes Project² represents the opportunity to lead the world in the field of registry data. The data contained in this report represents just the first few years of the NAHR, but it will allow us to follow the outcome of non-arthroplasty surgery over the lifetime of our patients. We hope you enjoy reading this report and that it encourages you and your colleagues to contribute data.

¹ (https://www.britishhipsociety.com/uploaded/NAHR_MDS_1.1.pdf)

² (<http://www.boa.ac.uk/pro-practice/boa-quality-outcomes-project/>)

2 Aim of the NAHR

The NAHR, which is open to members and non-members of the BHS, aims to benefit both patients and surgeons by collecting longitudinal data on patients with hip pathology, whether or not they undergo surgery. Relevant operations include: arthroscopic and open surgery for femoro-acetabular impingement (FAI); peri-acetabular osteotomy (PAO); femoral osteotomy; slipped capital femoral epiphysis (SCFE) surgery; developmental dysplasia of the hip (DDH); and other treatments for extra-articular hip problems such as trochanteric bursitis. In fact, any operation other than arthroplasty and acute fracture treatment is suitable for inclusion. It is quite likely that private institutions as well as NHS Trusts will soon require proof that outcome data is being collected.

The NAHR data will be used to bring direct benefits to patients by:

- Improving patient awareness of the outcomes of operations on the hip, since results will be available in the public domain.
- Comparing the success rates of different operations and surgical approaches on the hip.
- Helping to identify whether they would benefit from a specific surgical technique
- Identifying which surgical procedure is most likely to bring benefit for a specific diagnosis.

The NAHR data will bring additional long-term benefits to surgeons and hospitals by:

- Providing feedback to orthopaedic surgeons to define which patients will benefit from surgery and what details of the operative procedure will define a good result; validated outcome data will be available to the surgeon
- Identifying which patients are likely to benefit from a particular procedure
- Promoting open publication of outcomes following surgery
- Linking to Hospital Episode Statistics (HES) and National Joint Registry (NJR) data to enable follow-up into arthroplasty, and accurately follow the lifespan of a patient's hip joint

3 Background of the NAHR

In 2011, the National Institute for Health and Clinical Excellence (NICE) published guidance on open and arthroscopic femoro-acetabular surgery for hip impingement. This guidance recommended inclusion of this type of surgery into a non-arthroplasty hip register. In response, the NAHR was launched at the BHS Annual General Meeting in 2012, and it continues to develop in response to feedback from users and the NAHR User Group.

The interface and forms have been simplified and a new Minimum Dataset (MDS) defined. The simplified NAHR went live on Monday 4th November 2014. New forms were designed with a similar feel to the NJR forms, to enable hospitals to use their existing NJR data entry infrastructure, freeing surgeons from data entry. Forms are available for download on the BHS website³.

The MDS 1.1 includes information sheets, consent forms, mandatory scoring sheets, and forms for surgical details and findings. As well as a mandatory MDS, surgeons may also wish to complete the Enhanced Dataset. Following entry into the NAHR, and providing an email address has been included, all further follow-up is automated, as patients are emailed and asked to complete on-line mandatory scores at six, 12 and 24 months post-operatively.

At each Annual General Meeting of the BHS, an update of the NAHR is presented and a workshop arranged to encourage surgeons to join and submit data to the NAHR. This, the first Annual Report, provides a summary of the data available to date and can be used to guide further development of the register.

³ (www.britishhipsociety.com)

4 Overview of data

4.1 Pathways per year

Every time a patient has an operation recorded on the NAHR, a pathway is created. This pathway follows the patient from pre-operative scores through the operation, if this occurs, and on to longer-term follow-up. One patient may have up to two pathways, one for each hip. The same pathway on each hip is used for multiple surgeries so that relative changes in function can be measure right the way to arthroplasty, if this occurs. The indication for surgery was not recorded in the majority of cases.

Femoro-acetabular Impingement was the only indication positively recorded for open and arthroscopic surgery, with the exception of PAO, which were commonly performed for acetabular dysplasia. **Figure 1** shows the numbers of pathways per year broken down by surgical approach and year.

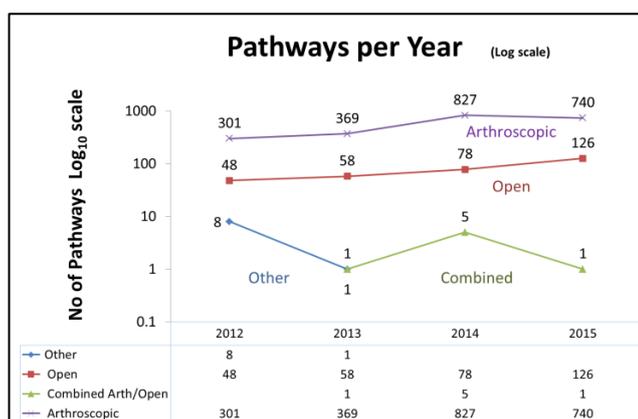


Figure 1 Pathways per year by surgical approach

Due to the small numbers of 'combined arthroscopic and open' and 'open' approaches a logarithmic scale is used. Overall, 87% of pathways related to arthroscopic surgery and 12% related to open surgery, including osteotomies and open surgical debridement for hip impingement.

Figure 2 represents the same figures in bar chart form.

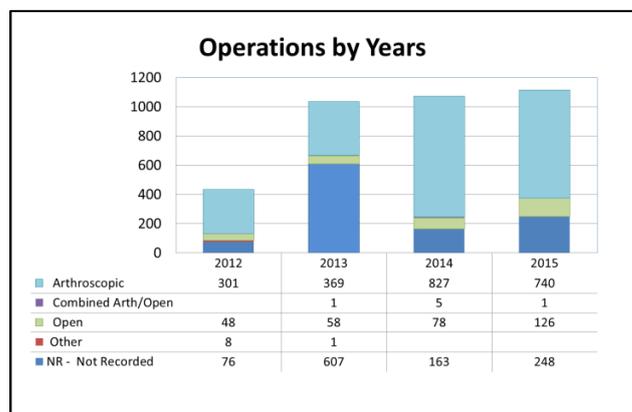


Figure 2 Operations by years

In 2013 there were a significant number of pathways (59%) where no surgical approach was recorded. This figure has improved since then but still accounts for 18.8% of all pathways over 2014-2015. Future changes to the data entry will prevent this, as more fields become mandatory for completion.

4.2 Number of surgeons using NAHR

Figure 3 shows the number of unique surgeons entering pathways per year since 2011, prior to the official launch in 2012. This has steadily increased such that 33 surgeons were entering data in 2015.

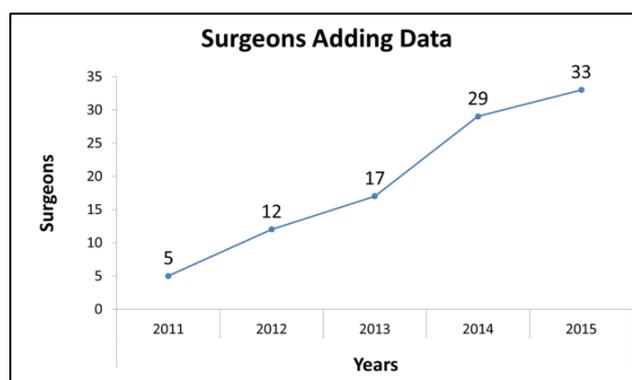


Figure 3 Surgeons adding data to the NAHR

It is impossible to know what the true denominator is for surgeons performing hip preservation surgery, but it is clear that many surgeons have not yet entered data. The aim is to increase this through improved advertising, local NAHR linkmen and educational sessions at national meetings.

4.3 Surgeon-patient procedures

Of the surgeons entering data, a large number have submitted fewer than 11 pathways. There are a few surgeons who, through bulk upload of historical personal databases or high volume practices, have submitted large numbers of procedures as shown in **Figure 4**

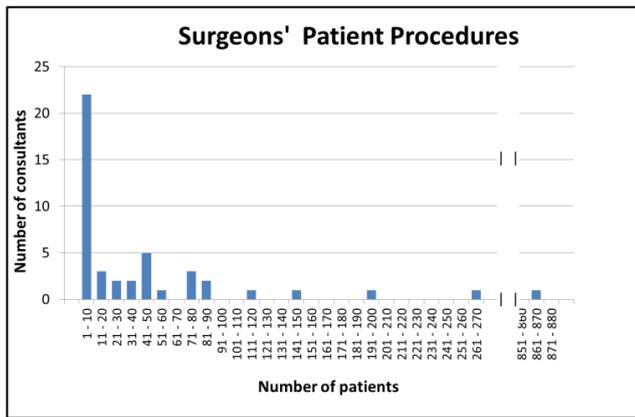


Figure 4 Procedures per surgeon

It is highly likely that the surgeons submitting low numbers to the NAHR are not low-volume surgeons. They may have not yet committed all of their cases and may have been testing the interface and data entry.

4.4 Funding source for surgery

Figure 5 shows the funding source by surgical approach. This demonstrates a similar proportion of arthroscopic versus open procedures (23% vs. 20% respectively) were performed in the independent sector when compared to the National Health Service.

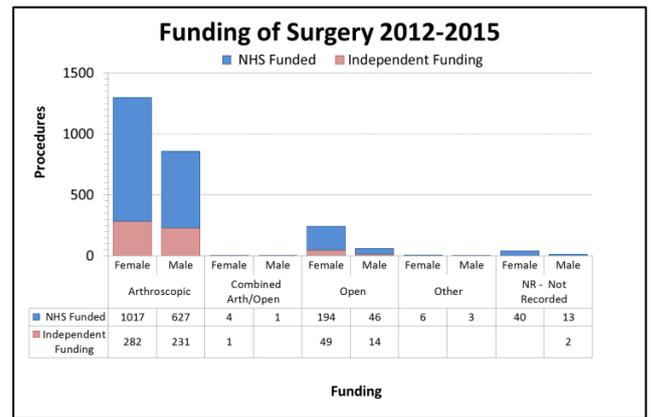


Figure 5 Funding of surgery per year

There was no significant difference in the ratio of males and female patients in the two groups.

5 Demographics

5.1 Patients by age and approach

The analysis of patient age by surgical approach demonstrates a positively skewed distribution towards a younger age group, as one might expect for hip preservation procedures. **Figure 6**

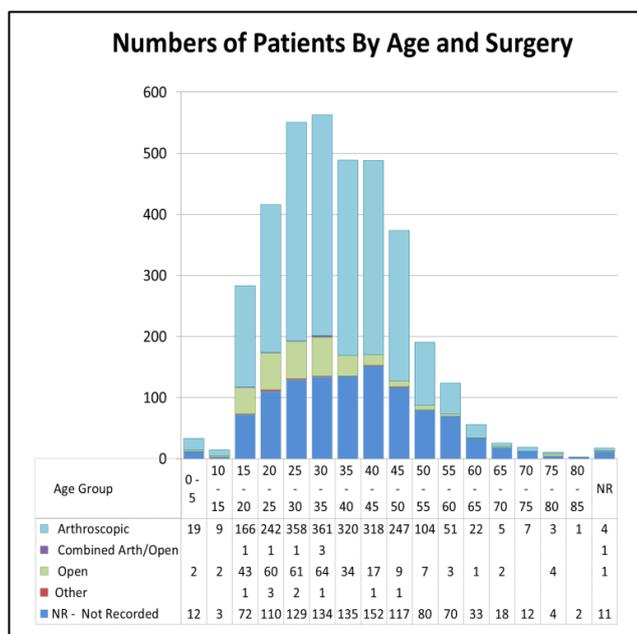


Figure 6 Patients' age distribution

84% of cases entered on the NAHR were between the ages of 15 and 50 years and 48% were between the ages of 20 and 40 years. There are large numbers of paediatric hip preservation procedures performed that are not being recorded with less than 1% of having been performed on patients less than five years old. Although paediatric surgeons were involved during development of the minimum dataset, not many surgeons performing hip-preservation surgery in the paediatric population are submitting data and more work to engage these surgeons is planned.

5.2 Gender distribution by surgical approach

According to this NAHR data more women than men undergo all forms of non-arthroplasty surgery. **Figure 7**

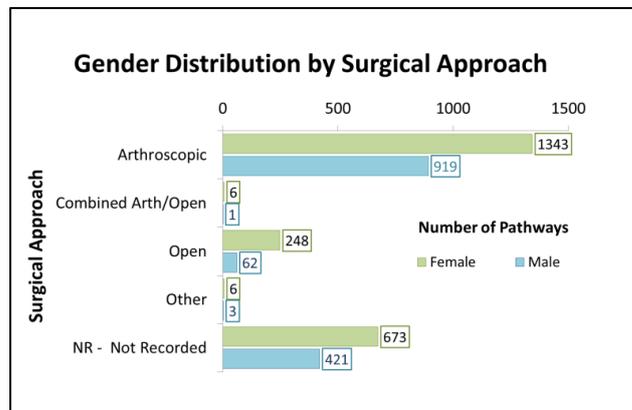


Figure 7 Gender distribution 2012-2015

Of those patients undergoing hip arthroscopy, 60% were female compared to 80% of patients undergoing open procedures. This may represent the higher incidence of acetabular dysplasia in women and their consequent treatment with peri-acetabular osteotomy, which is included in the open group.

5.3 Body mass index (BMI) by operation type and gender

Body Mass Index (BMI) was recorded in only 21% of cases but the rate of data acquisition, in keeping with many parameters, has improved over the first few years of the register. Of the current data, 86% of patients were recorded as having a BMI of between 18.5 and 30 with 4% recorded as having a BMI greater than 36 and 2% less than 18.5.

Figure 8

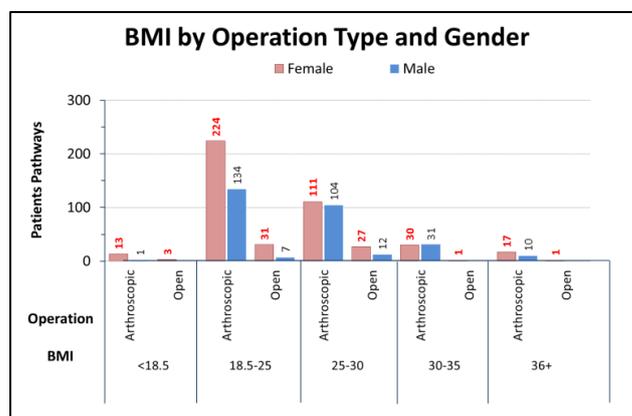


Figure 8 BMI and operation type

6 Compliance

6.1 Follow-up and linkage data

Follow-up for the NAHR is automated and patients are sent emails with hyperlinks back to the registry to complete review scores at six months, one and two years post-operatively. Inclusion of an email address is key to this follow-up and should be recorded as part of the consent process. In addition to this, a mobile phone number is requested to allow follow-up of patient via phone should emails remain unanswered. There are anecdotal reports that patients are less inclined to give mobile phone numbers but are happy to add an email address to the consent form. This is reflected in **Figure 9**

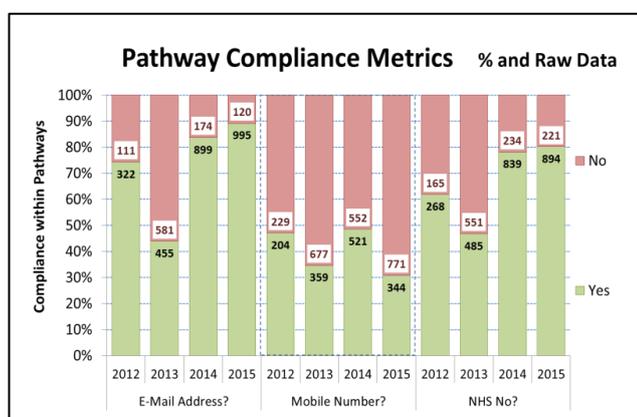


Figure 9 Pathway compliance

This shows the recording of key information for follow-up and includes email address, mobile phone number and NHS number. Recording of email addresses in 2015 was 89% and improved significantly from 2014, probably with the introduction of the new consent and MDS form. As suspected, the recording of mobile numbers has been less consistent and possibly even declining.

One of the aims of the NAHR is to allow life-long follow-up of patients through the registry and, if arthroplasty occurs later in life, via the National Joint Registry (NJR).

In order to do this and link to Hospital Episode Statistics (HES) data then an NHS number is required. Again, the accuracy of recording this information improved significantly in 2014 with the introduction of new data entry forms, and in 2015 was recorded in 80% of cases. As shown in section 4.4, approximately 20% of cases on the NAHR are performed in the independent sector. It is unlikely that NHS numbers are easily available in these hospitals and this may be reflected in the recording of NHS numbers overall. The NAHR website contains details via [this link⁴](#) on how to find NHS numbers for patients operated on in the independent sector.

6.2 Consent rates

In order for a patient to be linked to other pathways and HES data, consent for data collection is required. Over the past three years consent rates have improved from 45% to 91% in 2015 (see **Figure 10**) in keeping with the improved dataset and consent forms.

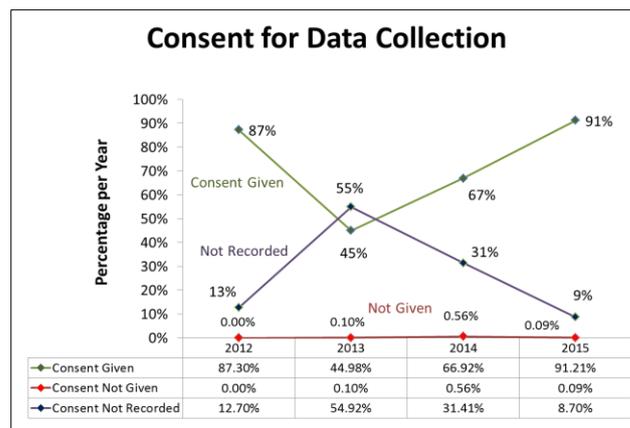


Figure 10 Consent for data collection

In addition in 2014:
 6 people withdrew consent (0.56%)
 6 people rejected consent via patient portal (0.56%)

4

<https://www.britishhipociety.com/uploaded/Clinicians%20NHS%20number.doc>

7 Collection of mandatory scores

7.1 Overview of scores

The NAHR offers clinicians the opportunity to use various hip scores for patient assessment pre- and post-operatively. The NAHR User Group defined that only two hip scores would be mandatory for collection in the minimum dataset, with others available depending on surgeon preference. The mandatory scores are the EQ-5D-5L (including the EQ-5D-VAS) and the iHOT-12. Scores are recorded pre-operatively then routinely, via email, at six months, one and two years post-operatively.

7.1.1 EQ-5D Index

The EQ-5D index score is based on five domains (mobility, self-care, usual activities, pain/discomfort and anxiety/depression) each with five options (no problems, slight problems, moderate problems, severe problems and extreme problems).

7.1.2 EQ-5D VAS

The EQ Visual Analogue score records the respondent's self-rated health on a 20cm vertical scale where endpoints are labelled 'Best imaginable health state' (100 points) and 'Worst imaginable health state' (0 points). It is important to note that this is not a pain visual analogue score but a measurement of general well-being and the results should be interpreted with this in mind

7.1.3 iHOT-12

This is a short form equivalent of the International Hip Outcome Tool-33 which was developed by the Multicenter Arthroscopy of the Hip Outcomes Research Network (MAHORN). The iHOT-33 was developed for active patients (18-60 years; > Tegner 4) presenting with a variety of hip conditions. The shorter 12 question patient-derived, patient-reported outcome measure demonstrates excellent agreement with the long version.

This report only includes the findings related to these mandatory scores. The scores are recorded as being in one of three categories: done; due; or overdue. The collection of each of these scores is presented in the following figures.

7.2 Rate of score collections

7.2.1 EQ-5D Index

Figure 11 shows the rate of collection of the Index scores at the various time intervals. Once again the rate of completed scores improved significantly in 2014 with the new minimum dataset. In 2015, 11% of pre-operative scores had not been collected compared with 87% in 2012.

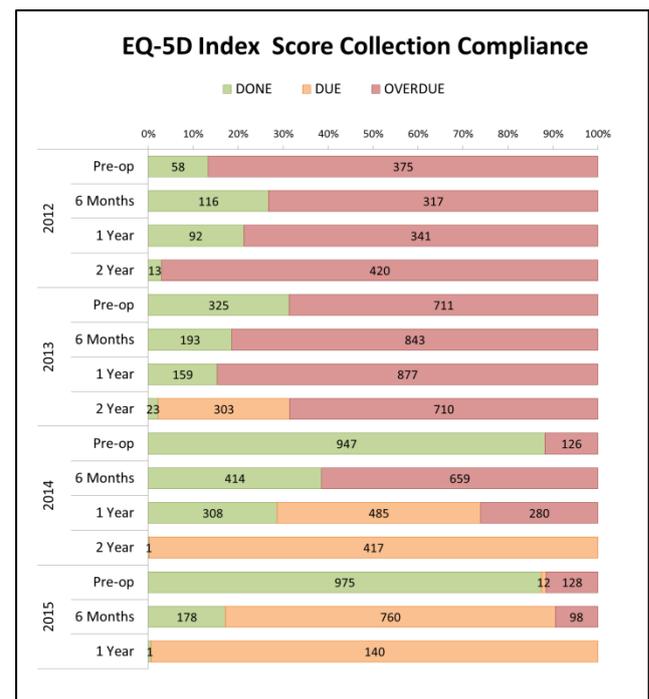


Figure 11 EQ-5D Index score collection compliance

7.3 EQ-5D VAS

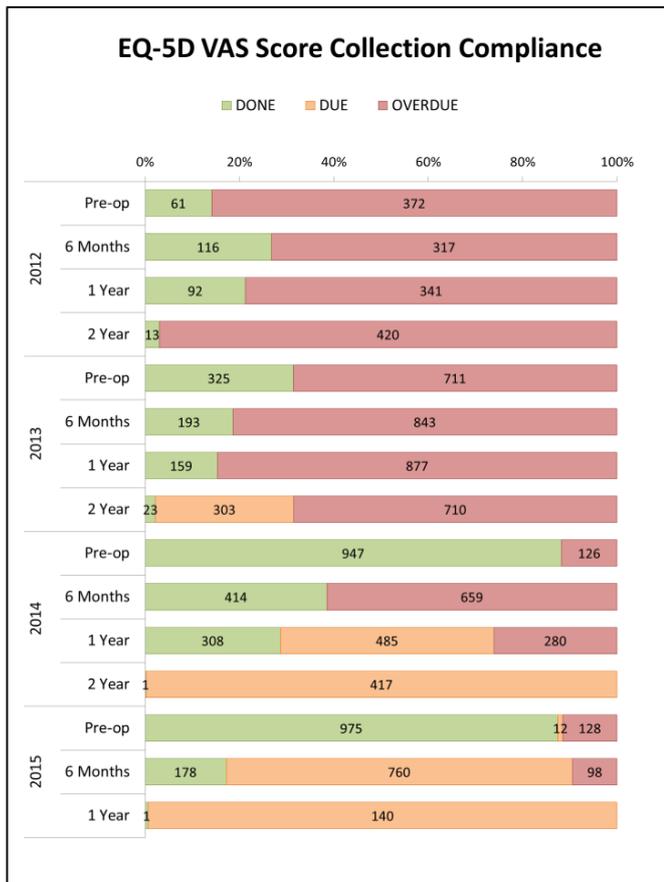


Figure 12 EQ-5D VAS score collection compliance

The collection rate of the VAS score mirrors that of the Index due to the fact that collection of these scores is presented on the same datasheet. See [Figure 12](#).

7.4 iHOT-12

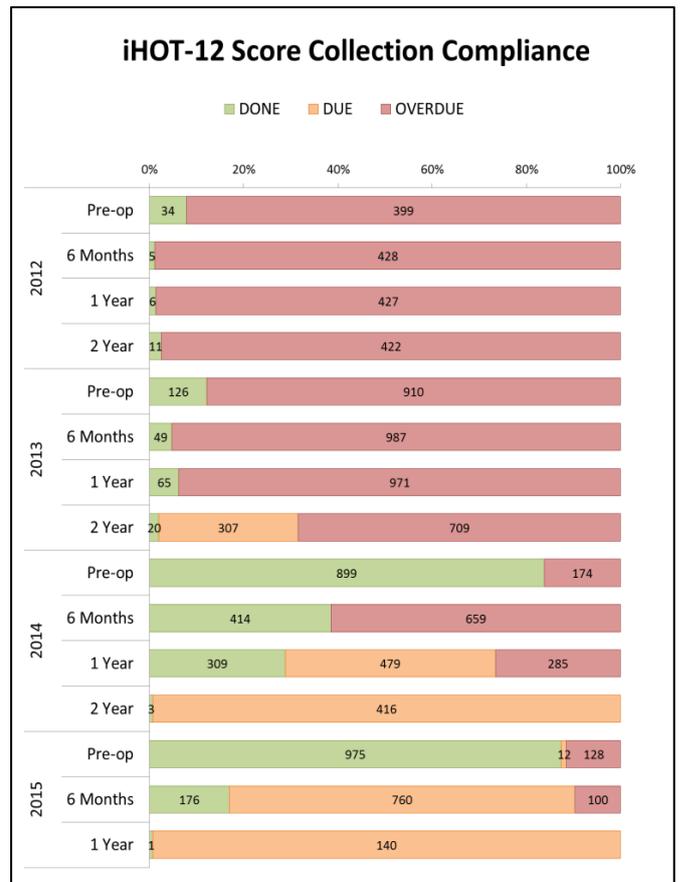


Figure 13 iHOT-12 score collection compliance

The iHOT-12 score was presented to the International Society of Hip Arthroscopy (ISHA) in 2011. It is therefore a relatively new scoring system and hence less well known amongst surgeons. This may be reflected in the slightly reduced uptake of this score in the first two years of the NAHR, despite it being a mandatory score for the minimum dataset. Since 2014, this score has been collected as part of the same scoring sheet as the EQ-5D and the collection rates in 2014 and 2015 are very similar to those for EQ-5D. See [Figure 13](#).

8 Surgical findings at arthroscopy

Figure 14 shows the findings recorded at arthroscopy on a logarithmic scale. Up to four findings are recorded, as shown the table. The largest single finding was labral tear,

as might be expected. Labral tears and chondral defects were also common and a small number of ligamentum teres ruptures were recorded.

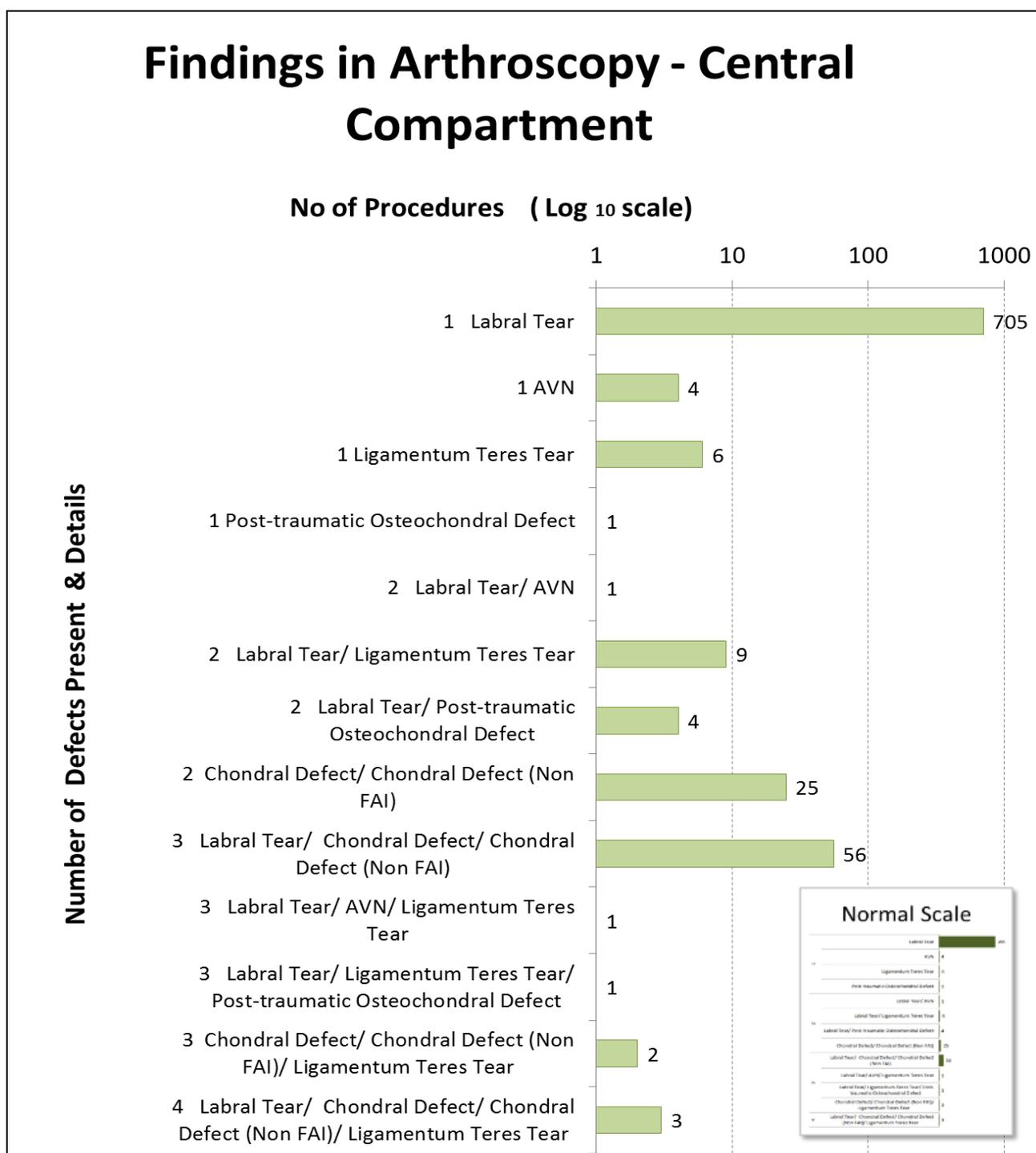


Figure 14 Findings in arthroscopy - central compartment

9 Surgical procedures

Figure 15 to Figure 18 show the different types of surgical procedures in the NAHR, including core acetabular and femoral procedures, additional surgical procedures and the different combinations of femoral and acetabular osteomies.

9.2 Acetabular procedures

Labral debridement is the most commonly performed acetabular procedure in arthroscopic surgery, accounting for 35% of procedures compared to 17% indicating labral repair. With open procedures, only 14% are classified as labral debridement compared with 57% classified as repair.

Although the indications for surgery may vary between arthroscopic and open approaches, the difference in rates of repair compared to debridement may well relate to the technical challenges of labral repair arthroscopically.

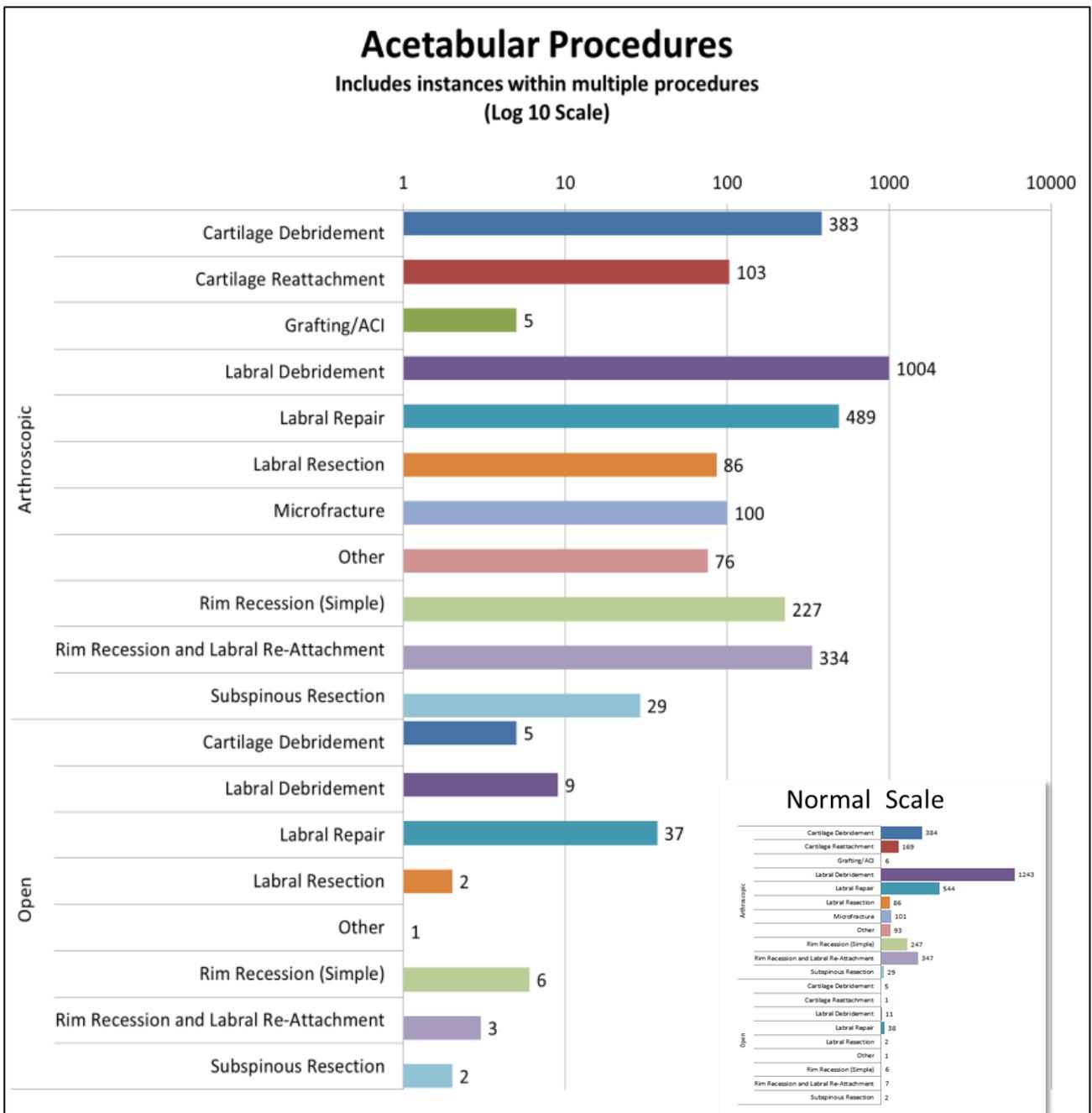


Figure 15 Acetabular procedures

9.3 Femoral procedures

Figure 16 shows the range of femoral procedures recorded on the NAHR. As might be expected, cam removal accounts for the largest proportion of procedures, at 89% overall, with no difference in the rate between arthroscopic and open

approaches. A very small number of cartilage procedures are recorded, including debridement, microfracture and cartilage grafting.

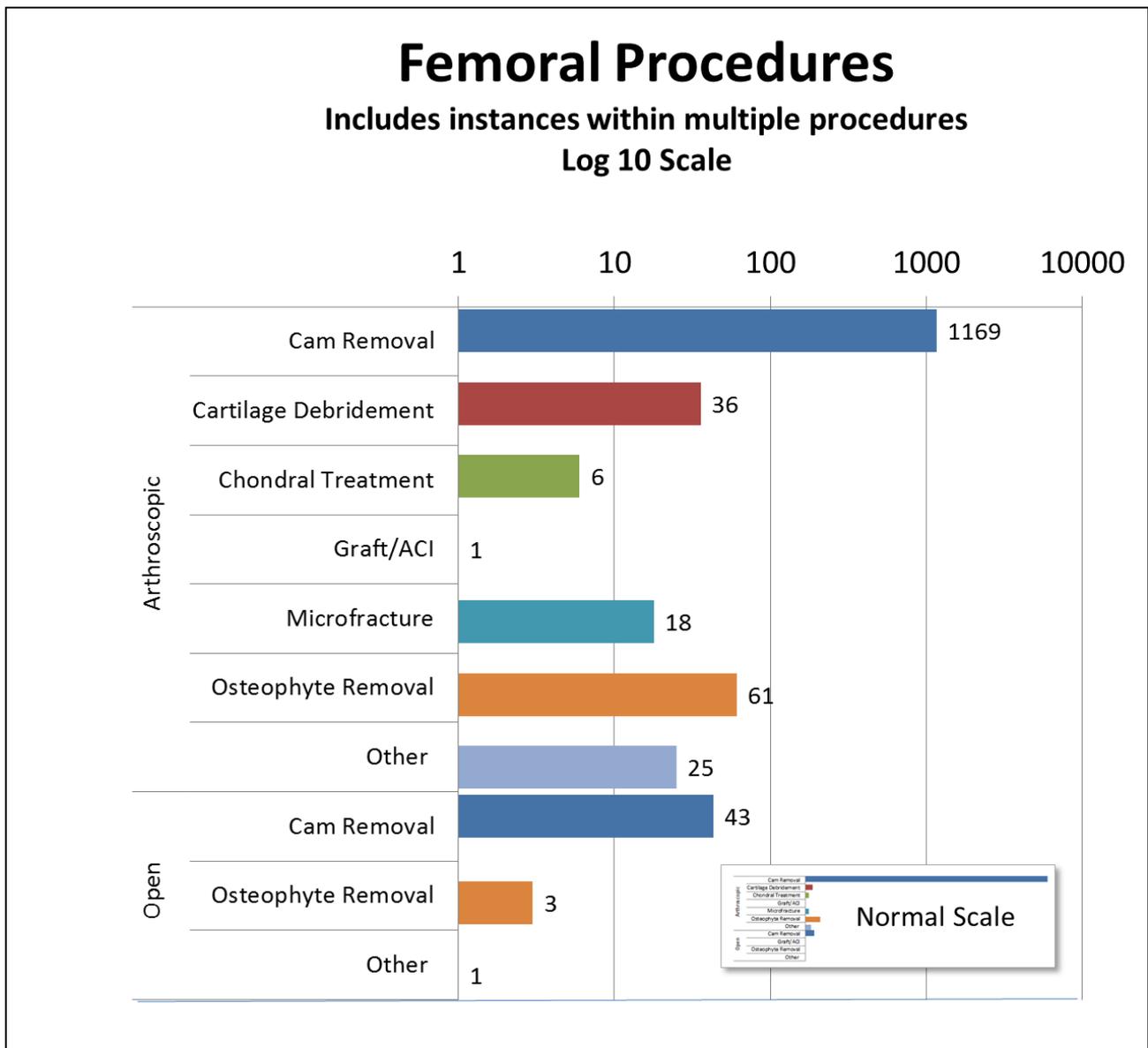


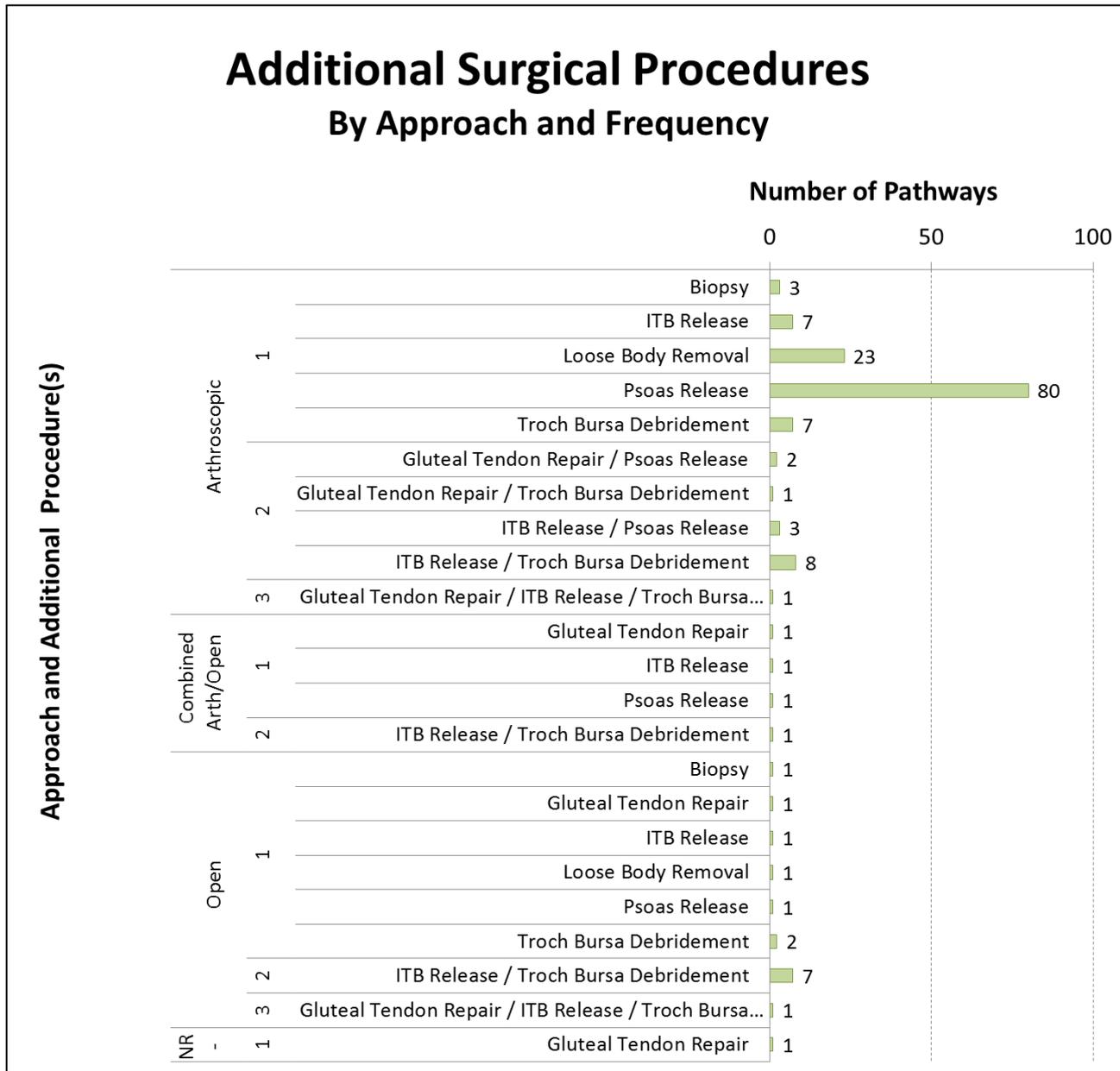
Figure 16 Femoral procedures

9.4 Additional surgical procedures

The NAHR dataset records a wide range of additional surgical procedures performed during hip-preservation surgery, the majority of which relate to extra-articular structures and soft tissue releases. Relatively few of these procedures are recorded and the majority were performed as part of an arthroscopic approach.

Figure 17 details the different combinations of additional procedures by surgical approach. Two procedures in particular, psoas release and loose body removal, account for approximately two-thirds of all additional procedures performed.

Figure 17 Additional surgical procedures



9.5 Femoral and acetabular osteotomies

Figure 18 shows the combinations of different femoral and acetabular osteotomies. Overall a small proportion of osteotomies are recorded in the NAHR, with the majority being peri-acetabular osteotomies (PAO) for dysplasia (n=160). There are a further eight who had combined PAO and femoral osteotomies and a small number of other femoral and paediatric acetabular osteotomies.

		Pelvic Osteotomy			
		None	Chiari	PAO	Salter
Femoral Osteotomy	None	3040		160	
	Complex	1		1	
	Derotation	3			
	Derotation Varus	1		1	
	Other	4			
	Shortening	1			1
	Troch Advancement	3		4	
	Valgus		1	1	
	Varus	1		1	

Figure 18 Combination of osteotomies

10 Outcome scores

All scores are presented as a mean score +/- one standard deviation. It is acknowledged that showing two standard deviations would show 95% confidence intervals. However at present, the variance of the data, with relatively small numbers and heterogeneous surgical procedures, does not allow statistically significant conclusions to be drawn. Future annual reports, with greater numbers and more complete datasets, will allow further sub-categorisation of procedures and a more thorough statistical analysis.

10.1 Surgical approach

Figure 19 to Figure 21 show the pre-operative, six months and one and two year scores by surgical approach.

Although the numbers are too small and the variance too great to show significance, there does seem to be a trend towards improvement in all three of the mandatory scores. There is a suggestion that the outcome of hip arthroscopic procedures continues to improve out to two years. The outcome of open procedures is similar, but there is a suggestion that the outcome at two years deteriorates to pre-operative levels.

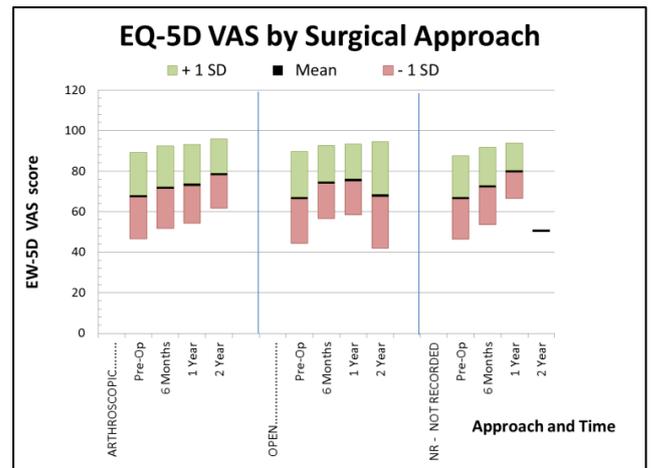


Figure 20 EQ-5D VAS by surgical approach

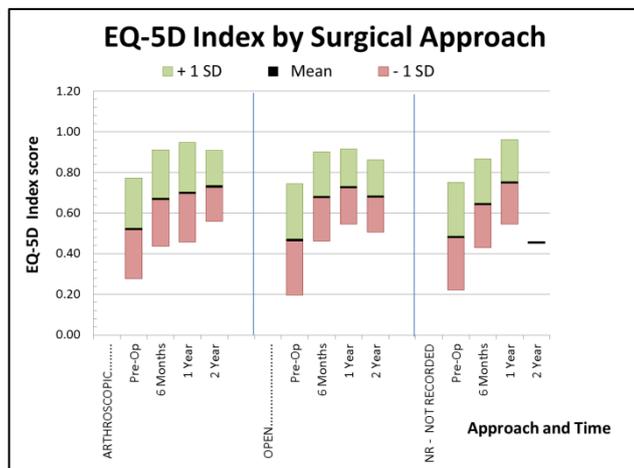


Figure 19 EQ-5D Index by surgical approach

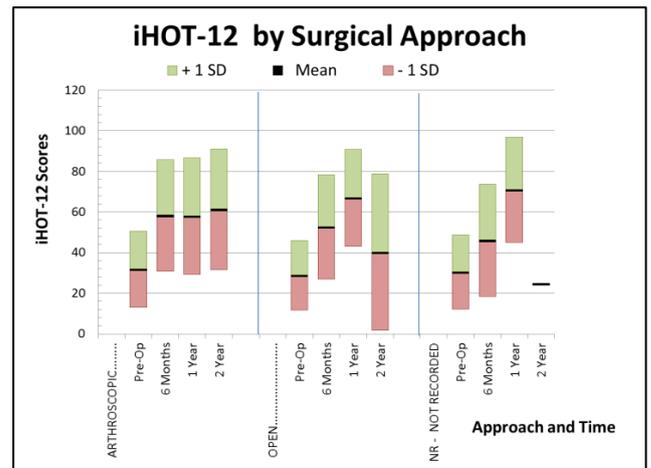


Figure 21 iHOT-12 by surgical approach

10.2 Surgical technique

10.2.1 Labral repair vs. labral debridement

There is on-going debate about how to manage labral pathology. Although some studies have shown better outcomes in labral repair and preservation, these studies have not been randomised trials and selection bias makes interpretation difficult. Although similar bias is clearly relevant in this report, the data from the NAHR is grouped into three distinct categories – labral repair, labral debridement, and those recorded as having both techniques. The outcome of the three mandatory scores for labral debridement vs. labral debridement and repair vs. labral repair are shown in **Figure 22** to **Figure 24**. Pre-operative scores between the three groups are similar and there is a trend towards improvement out to one year with no clear difference between the three treatment groups. The EQ-5D VAS perhaps showed less evidence of an improvement post-operatively than other groups.

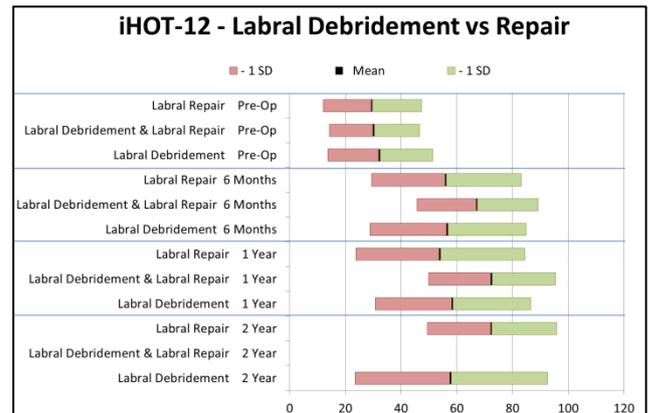


Figure 24 iHOT-12 - Labral debridement vs. repair

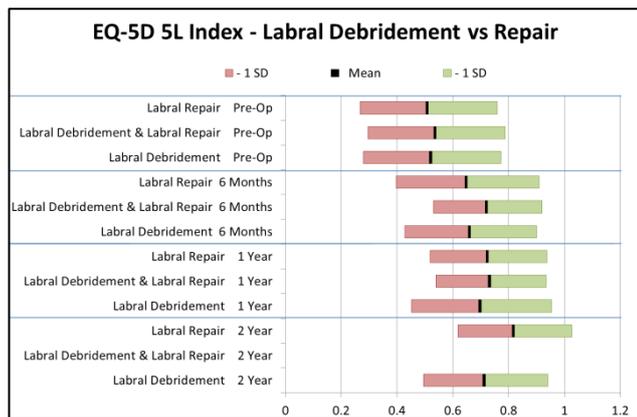


Figure 22 EQ-5D Index - Labral debridement vs. Repair

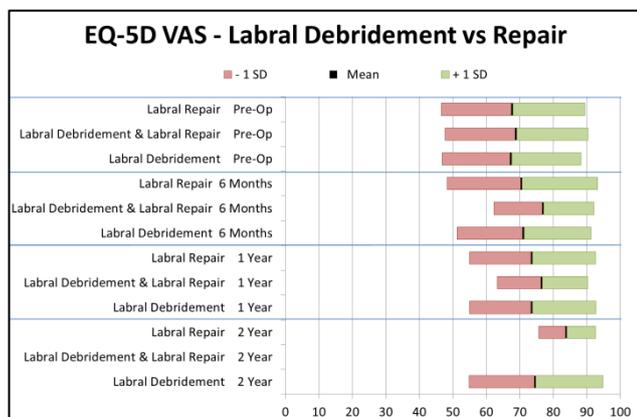


Figure 23 EQ-5D VAS - Labral debridement vs. repair

10.2.2 Acetabular procedures - Rim Recession

Regarding acetabular rim recession, the NAHR records this as either complex, involving labral reattachment or simple, which would include retro-labral rim recession, leaving the chondro-labral junction intact or rim recession of a calcified labrum with no clear labrum to detach. The outcomes of the three mandatory scores are shown in **Figure 25** to **Figure 27**.

EQ-5D Index

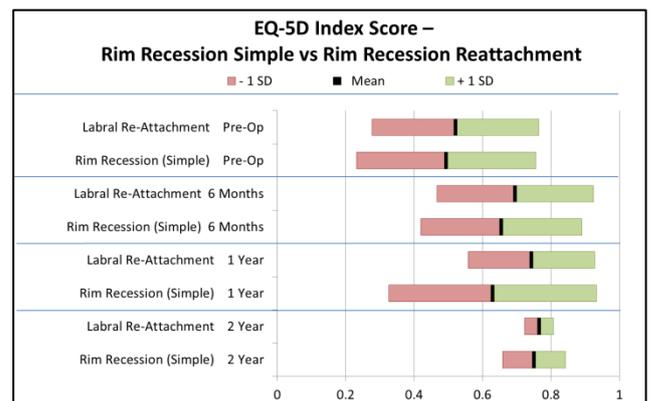


Figure 25 EQ-5D Index Score – Rim recession simple vs. Rim recession reattachment

The EQ-5D Index is similar pre-operatively between the two groups. Post-operatively, out to two years, there is a trend towards improvement with no obvious difference between the two groups.

EQ-5D VAS

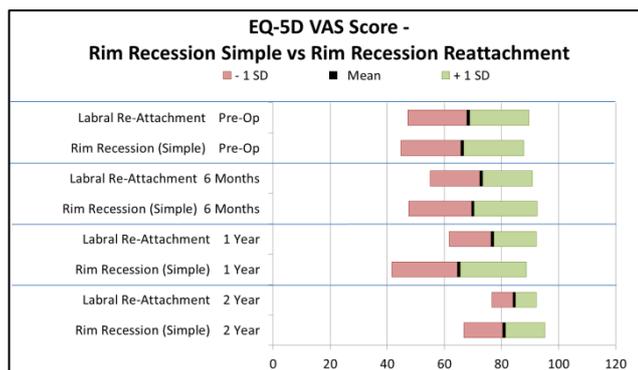


Figure 26 EQ-5D VAS Score - Rim recession simple vs. Rim recession reattachment

The EQ-5D VAS is similar between the two groups but does not show the same trend towards improvement and seems to remain fairly static even out to two years. The iHOT-12 again shows similar pre-operative scores and a trend towards improvement post-operatively.

iHOT-12

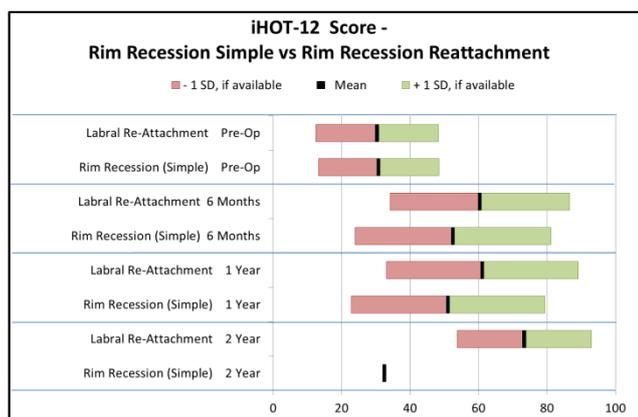


Figure 27 iHOT-12 Rim recession simple vs. Rim recession reattachment

The iHOT-12 at two years for simple rim recession without reattachment appears to decline to pre-operative levels at two years. However, the number with two year scores is small, and any apparent changes are not statistically significant.

10.2.3 Femoral procedures

Femoral work on the NAHR is categorised, for the purpose of this report, into five domains: cam removal alone; osteophyte removal; cartilage debridement; cam and osteophyte removal; and cam removal and cartilage debridement. The mandatory outcome scores are shown in [Figure 28](#) to [Figure 30](#).

There is no clear difference in the pre-operative scores for the groups although again, there is a trend towards improvement at six months. Beyond this the scores are less complete.

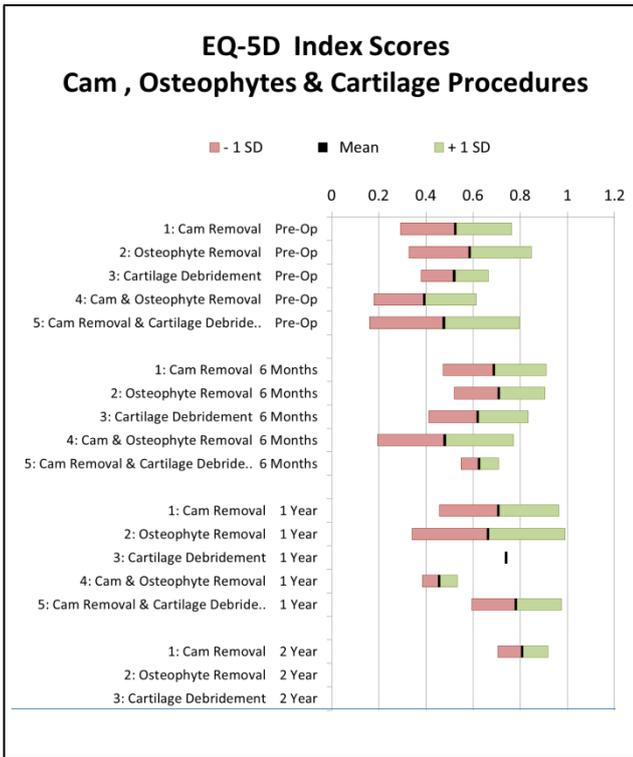


Figure 28 Femoral procedures EQ-5D Index scores

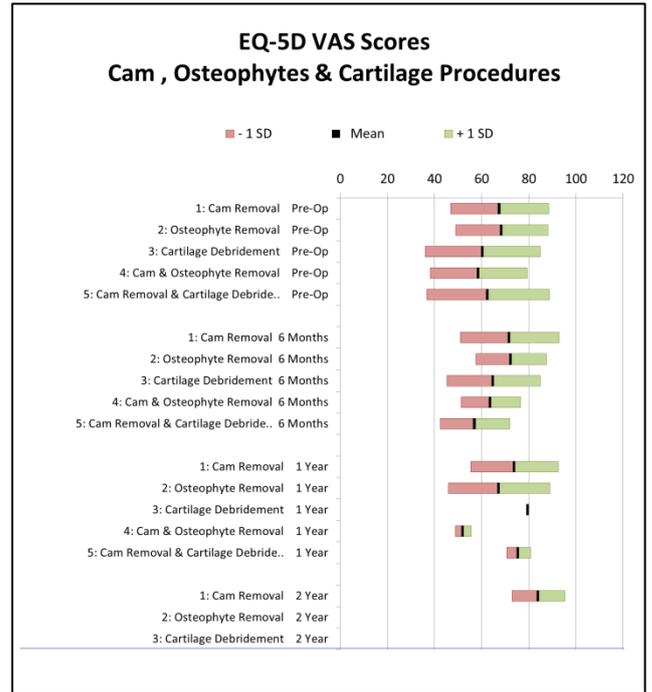


Figure 29 Femoral procedures EQ-5D VAS scores

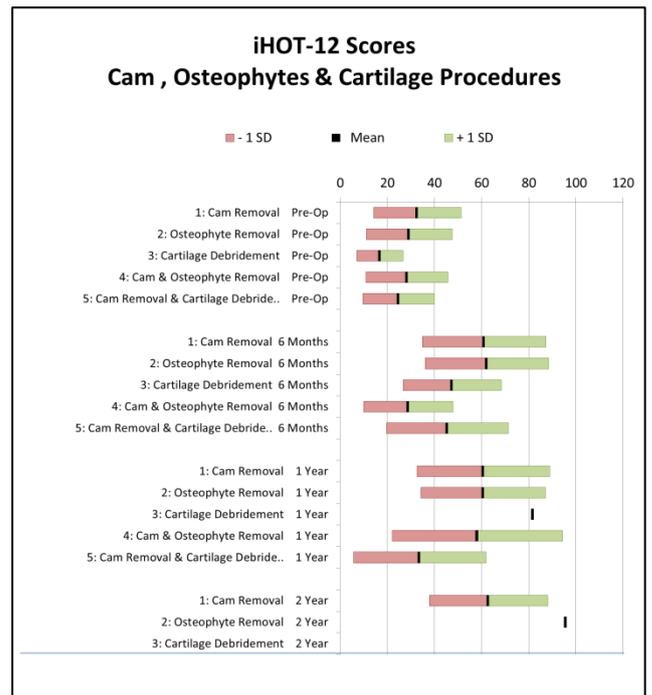


Figure 30 Femoral procedures - iHOT-12 scores

10.3 Outcome following isolated peri-acetabular osteotomy

There were 160 PAOs recorded without simultaneous femoral osteotomy. The following graphs **Figure 31** to **Figure 33** show the three mandatory scores for these cases in isolation. For these 160 cases the numbers of pathways with 2 year scores were so low and with such large variance, that these scores have been removed from the figures.

10.3.1 EQ-5D Index - PAO

Figure 31 Similar trends are shown the index score with an improvement on the pre-operative scores, which appears to be maintained out to one year post-operatively.

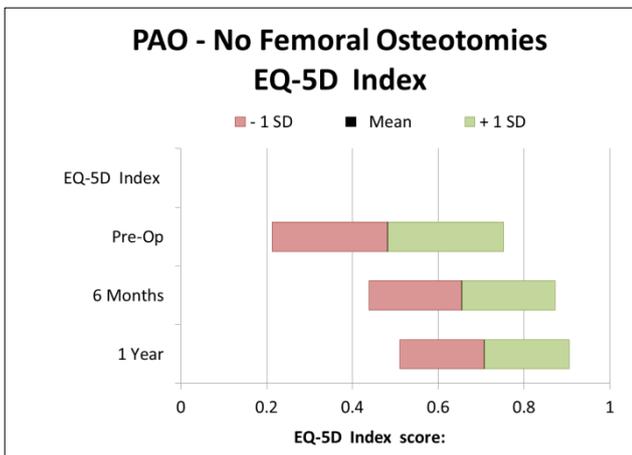


Figure 31 PAO EQ-5D Index scores

10.3.2 EQ-5D VAS - PAO

Figure 32 demonstrates a flat response to PAO with no clear trend post-operatively.

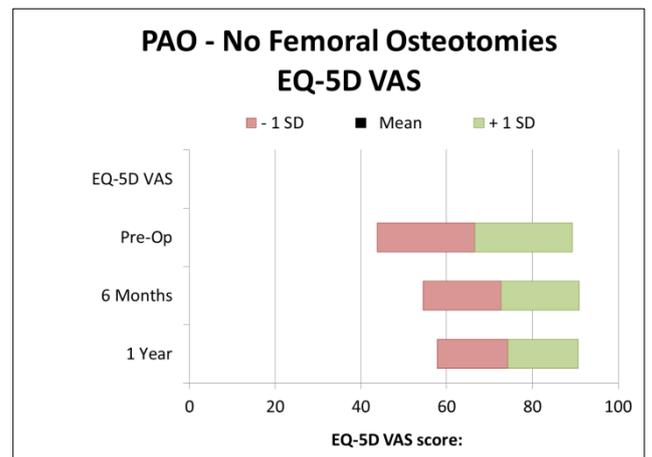


Figure 32 PAO EQ-5D VAS scores

10.3.3 iHOT-12 - PAO

There is a trend towards improvement in the iHOT-12 score at six months and one year post-operatively.

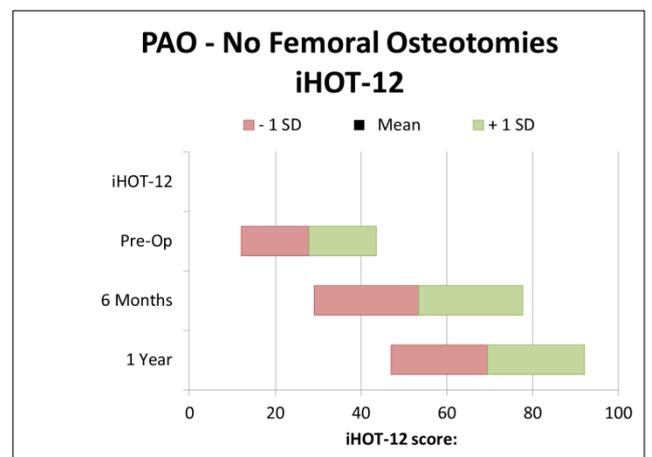


Figure 33 PAO iHOT-12 scores

11 Summary

Since its introduction in 2012, the NAHR has been refined, and data entry has been simplified. The aim of the NAHR User Group has been to encourage data submission, and as part of this, a process for bulk upload of historical individual databases was established. A variety of scoring systems is available. The process has been aligned with NJR consent and data entry forms, to allow established NJR data collection pathways to be used for the NAHR.

Despite this, submission rates are lower than those for the NJR, although it is impossible to provide an accurate figure for this. Where the NJR uses implant sales as a denominator for compliance with their registry, there is no similar surrogate that can be used for non-arthroplasty surgery. However, we can be sure that there are many surgeons and hospitals performing these types of operation who do not submit data to the NAHR.

Through a range of workshops, one-to-one discussions and a recent survey of BHS members, the NAHR User Group has tried to identify the reasons behind this failure to participate in the NAHR. Just over half the surgeons surveyed stated that data entry in their hospital was a logistical problem, and a third said they had concerns about how the data would be used. In addition, many surgeons still did not know about the existence or remit of the NAHR.

The logistics for data entry in hospitals remains a problem even for the NJR - which has significantly more resources than the NAHR. It is hoped that the similarity of forms, and website simplification, will make the data-entry process easier, but it will still require the engagement of surgeons to educate and inform their data-entry staff about the NAHR.

Concerns over the mendacious use of data in the NAHR are a major concern. Currently no public money is used for the NAHR, and the BHS and its members own this data. Our aim is to ensure that this continues to be the case. The data from the NAHR and future reports can be used to advise surgeons, commissioners and patients as to how best to manage non-arthritis hip problems. It may take 10 years before we have enough data of reliable quality so that we can start to make comprehensive assessments, but the first few years of the NAHR have shown what is possible and where we can improve.

Although no statistical conclusions can be drawn from the data, we can see the range of procedures performed and the techniques employed within those procedures. It is clear that arthroscopic surgery is the most common type of operation recorded in the NAHR. For both open and arthroscopic procedures, there does appear to be a trend towards improvement in a variety of outcome scores and that this improvement is maintained out to two years post-operatively.

12 Future plans

The future success of the NAHR depends on several factors: the continuing support of the BHS Executive and the NAHR User Group; the engagement of surgeons to complete accurate datasets; the engagement of hospitals to ensure sufficient administrative support; and the engagement of patients and their completion of post-operative scores.

In addition, we need to thank Bluespier and Amplitude, in particular Carla Webb, Rebecca Holmes and Lauren Keer for their support in developing the user interface and database. To help progress this further, the NAHR User Group has been successful in engaging industry partners, who can see the benefits the NAHR offers, and who have agreed to support the registry financially. These funds will be used to develop the website further and to provide additional features such as individual surgeon reports similar to those offered by the NJR. These can be used for appraisal and personal development.

The NAHR User Group will also aim to improve publicity amongst surgeons and hospitals with regular newsletters and updates, in addition to the Annual Report. The development of a network of regional linkmen is one area in which the NAHR can improve, and which will help development and completeness of NAHR data collection.

Future developments will include:

- Greater detail in annual reports on the enhanced datasets.
- Larger numbers of pathways and follow-up scores, which will allow some statistical analysis to add to our knowledge of the success of different surgical approaches and surgical techniques.
- Presentations of anonymised data at national and international meetings, which will help to publicise the NAHR and its findings.
- The further development of a research group, which will allow data requests from surgeons keen to use data recorded in the Registry for their own research interests.
- Surgeon access to individual reports for use in appraisal and revalidation.

We look forward to presenting the next report in 2017, and hope that you have found the data in this report interesting and thought-provoking.

13 Units submitting data to the NAHR

- Alexandra Hospital, Redditch
- BMI Harrogate Hospital, Harrogate
- BMI The Alexandra Hospital, Stockport
- BMI The Droitwich Spa Hospital, Droitwich Spa
- BMI The Ridgeway Hospital, Swindon
- BMI Winterbourne Hospital, Dorchester
- Chapel Allerton Hospital, Leeds
- Colchester General Hospital, Colchester
- Derriford Hospital, Plymouth
- Dorset County Hospital, Dorchester
- Frimley Park Hospital, Frimley
- Great Western Hospital, Swindon
- Guy's Hospital, London
- Harrogate District Hospital, Harrogate
- Hereford County Hospital, Hereford
- Hexham General Hospital, Hexham
- Hospital of St John and St Elizabeth, London
- James Paget Hospital, Great Yarmouth
- Leeds General Infirmary, Leeds
- Leicester General Hospital, Leicester
- Lister Hospital, Stevenage
- London Bridge Hospital, London
- London Clinic, London
- Neath Port Talbot Hospital, Port Talbot
- Nuffield Health Exeter Hospital, Exeter
- Nuffield Health Glasgow Hospital, Glasgow
- Nuffield Health Leicester Hospital, Leicester
- Pembury Hospital, Pembury
- Peterborough City Hospital, Peterborough
- Princess Grace Hospital, London
- Queen Alexandra Hospital, Portsmouth
- Ramsay Ashtead Private Hospital, Ashtead
- Ramsay Duchy Private Hospital, Truro
- Ramsay Fitzwilliam Private Hospital, Peterborough
- Ramsay Oaks Private Hospital, Colchester
- Ramsay Pinehill Private Hospital, Hitchin
- Royal Berkshire Hospital, Reading
- Royal Bolton Hospital, Bolton
- Royal Cornwall Hospital, Truro
- Royal Devon & Exeter Hospital, Exeter
- Royal Infirmary of Edinburgh, Edinburgh
- Royal London Hospital, London
- South West London Elective Orthopaedic Centre, Epsom
- Southern General Hospital, Glasgow
- Spire Clare Park Hospital, Farnham
- Spire Harpenden Hospital, Harpenden
- Spire Manchester Hospital, Manchester
- Spire Murrayfield Hospital Edinburgh, Edinburgh
- Spire Norwich Hospital, Norwich
- St Anthony's Hospital, Sutton
- St Michael's Hospital, Hayle
- Stepping Hill Hospital, Stockport
- University College Hospital, London
- Wansbeck General Hospital, Ashington
- Wrightington Hospital, Wigan

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