

# Whitlam Orthopaedic Research Centre

Biannual Report 2012-2013





Gough Whitlam was the federal member for the electorate of Werriwa, in south-west Sydney, from 1952 to 1978. He was Prime Minister of Australia from 1972 to 1975, leading a Labor parliament for the first time in 23 years. The Whitlam era was one of significant change. Within a short period of time, the Whitlam government had opened relations with China, banned racial discrimination in sport, supported sanctions against apartheid, banned military conscription, abolished the death penalty for federal crimes, established legal aid, established universal healthcare, abolished university fees, and supported workplace equality pay for women, federal highways and a standard gauge rail line between states. Throughout his time in parliament, he strove to improve conditions in his electorate in south-west Sydney and in 2010, he gave his name to the Whitlam Orthopaedic Research Centre.

PHOTO: Gough Whitlam (seated) with, left to right, Prof Ian Harris (Director), Dr Richard Walker (Director of the Whitlam Joint Replacement Centre) and A/Prof John Ireland (Director)



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# Directors Report

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The directors are pleased to present the 2012-2013 Biannual Report of the Whitlam Orthopaedic Research Centre (WORC), which covers a period of considerable expansion in research activities.

*Staffing:* The number of personnel expanded over 2012/13 with the appointment of a permanent full-time Registry Manager, Elizabeth Armstrong, a full-time Project Officer, Deanne Jenkin, , a part-time Project Officer, Helen Badge, and a full-time Post-doctoral Research Fellow, Pooria Sarrami. The team is also supported by five casual research officers.

*Academic activities and research output:* The research activities and output of the organisation have continued to increase, year-on-year. WORC produced over 20 publications each year in 2012 and 2013 in peer-review journals such as The Lancet, Injury, Annals of Surgery, Journal of Arthroplasty, Clinical Orthopaedics and Related Research, the Journal of Bone and Joint Surgery, the Medical Journal of Australia and the ANZ Journal of Surgery. The directors also presented many papers at conferences and courses, including the American Academy of Orthopaedic Surgeons and the American Congress of Rehabilitation Medicine.

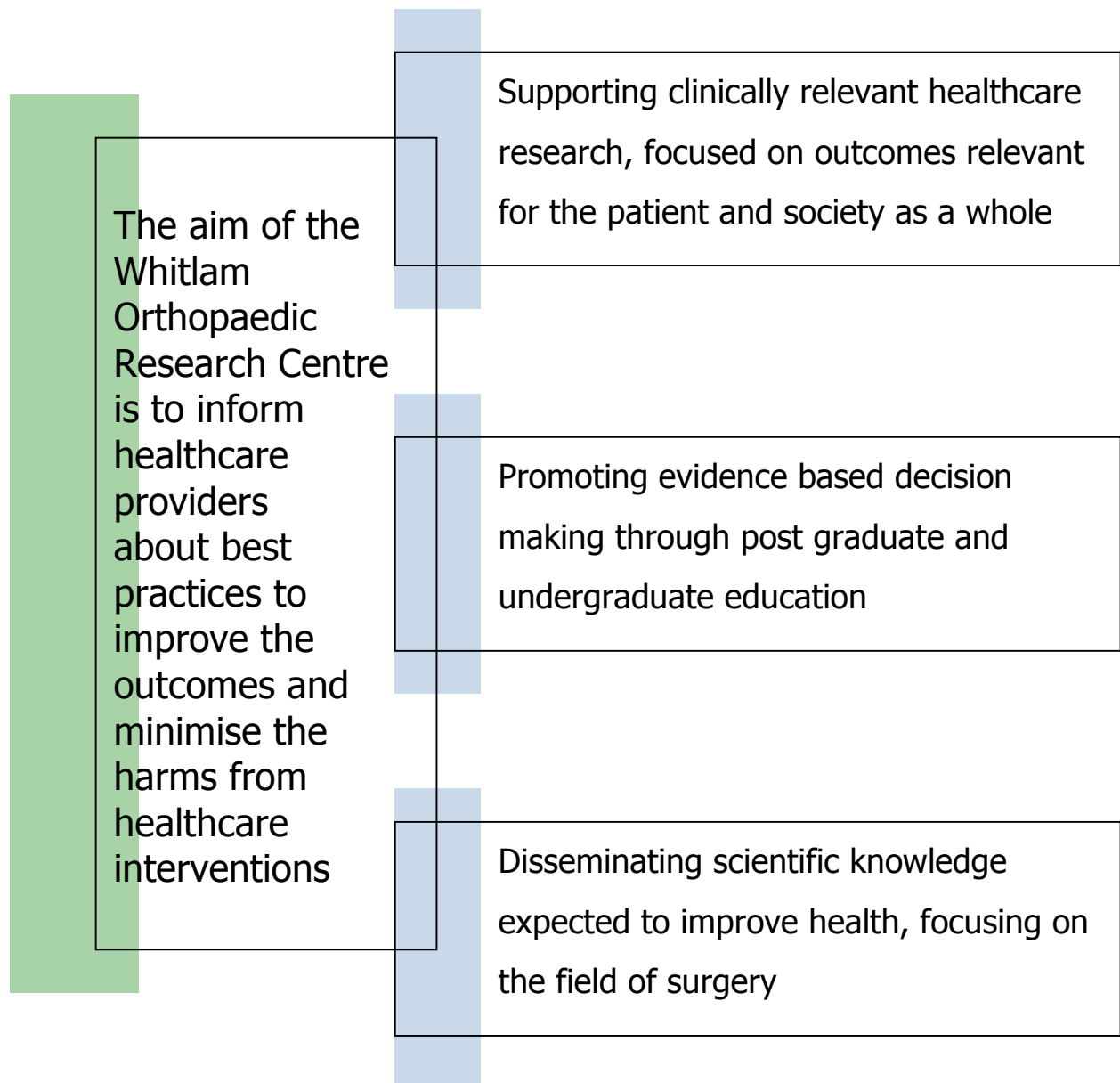
*Research students:* The number of students is steadily increasing, with a total of eight PhD candidates during 2012/2013, and two Masters students. Victoria Ko completed and was awarded her PhD in 2013; Sam Adie submitted his PhD in December 2013. In the last two years, five undergraduate UNSW medical students completed their Independent Learning Projects and one completed their Honours project.

*Peak Body and Committee representation:* The directors have also maintained their representation on government, hospital and professional committees, working under the NSW Ministry of Health Agency for Clinical Innovation (ACI), the Royal Australasian College of Surgeons and the Australian Orthopaedic Association (AOA). Professor Harris has continued his positions as the Stream Director for surgical specialties within the South Western Sydney Local Health District, the Injury and Rehabilitation Stream Director at the Ingham Institute for Applied Medical Research, Scientific Officer for the NSW branch of the AOA, co-chair of the Australian and New Zealand Hip Fracture Registry (ANZHFR), chair of the Arthroplasty Clinical Outcomes Registry (ACORN) and member of the Surgical Services Taskforce at ACI. Dr Naylor chairs the Liverpool Hospital Research Committee and maintains her membership with the SWS Transfusion Committee and the ACORN Committee.

*Successful grant applications:* 2012/13 also saw several successful grant applications, from the Motor Accidents Authority (NSW), HCF Research Foundation, and the National Health and Medical Research Centre. Deanne Jenkin and Helen Badge were subsequently employed by the MAA and HCF grants respectively. Both have since enrolled in post-graduate degrees through the University of NSW. The MAA has also

# Aims & Objectives

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# WORC Staff

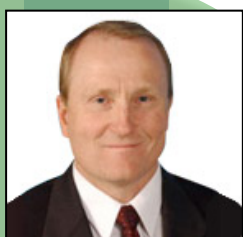
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## Directors:



**Ian Harris** MBBS, FRACS(Orth), FAOrthA, MMed (Clin Epid), PhD

Professor Harris is the Professor of Orthopaedic Surgery at the South Western Sydney Clinical School of the University of New South Wales, Director of the Injury Research Stream at the Ingham Institute for Applied Medical Research and the Director of Surgical Specialties for the South Western Sydney Local Health District. He holds a Master of Medicine in Clinical Epidemiology and a PhD in Surgery, both from the University of Sydney. He is a fellow of the Australian Orthopaedic Association and a member of the Australain Orthopaedic Trauma Society, the (North American) Orthopaedic Trauma Association and the American Academy of Orthopaedic Surgeons. Professor Harris's research interests include surgical outcomes, epidemiology, medicalisation, and research methodology. Professor Harris has published widely and lectures nationally and internationally on orthopaedics and evidence based medicine.



**John Ireland** MBBS, FRACS(Orth), FAOrthA.

Associate Professor Ireland completed a Fellowship in Joint Replacement surgery at the Norfolk and Norwich Hospital UK and was also awarded AO & Zimmer traveling Fellowships in Joint Replacement surgery and Trauma. Since returning to Australia, A/Prof Ireland has worked in the West and South West of Sydney. He established the Whitlam Joint Replacement Centre, based at Fairfield Hospital, servicing the South West Area Health Service.



**Justine Naylor** BAppSci(Phty), PhD

Justine graduated from The University of Sydney in 1987 with a Degree in Physiotherapy. She completed a PhD in Applied Physiology with the same university in 2002. She has worked in the orthopaedic field as a researcher since 2003, and is currently Senior Principal Research Fellow within WORC. Her research interests include monitoring, measuring and optimising outcomes after knee and hip replacement surgery, and the identification of best models of care in orthopaedics.



# WORC Researchers

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## Sam Adie

Dr. Sam Adie is an orthopaedic registrar, research officer and PhD student at the Whitlam Orthopaedic Research Centre (WORC). Sam submitted his PhD in December 2013, which was titled 'Investigating the Quality of Surgical Trials'. His research assesses the scientific quality of the evidence base used in surgical practice, and the extent to which different forms of bias influence study conclusions. Sam was awarded two fellowships for his doctoral thesis: the Sir Roy McCaughey Research Fellowship from the Royal Australasian College of Surgeons (RACS), and a Postgraduate Medical Research Fellowship from the National Health and Medical Research Council (NHMRC).

## Vicki Ko

Vicki Ko is a PhD student at the Whitlam Orthopaedic Research Centre. Vicki's area of study is rehabilitation after total knee replacement surgery. She conducted a multicentre, randomised controlled trial, comparing one-to-one physiotherapy, class-based physiotherapy and a monitored home program for patients after total knee replacement. Vicki was granted the UNSW Research Excellence Award, UNSW Rising Star Award and the Australian Postgraduate Award to conduct this research. Her PhD was awarded in 2013.

## Rajat Mittal

Dr Rajat Mittal is an orthopaedic registrar and PhD student whose thesis is based on a randomised controlled trial of ankle fractures (CROSSBAT: Combined Randomised and Observational Study of Weber B Ankle Fractures). This has been one of the largest multicenter orthopaedic trials in Australia and is expected to make a significant impact on surgical practice in Australia and worldwide.

## Darnel Murgatroyd

Darnel Murgatroyd is a current PhD student at the University of Sydney. Her thesis is titled "The effect of compensation type on outcome after motor vehicle trauma" and the main project involves a prospective observational study of patients admitted with injuries after motor vehicle collisions. She has also undertaken qualitative research with focus groups of injured patients and a systematic review.

## Helen Badge

Helen Badge is a full time PhD student who is managing a large multicenter project that is prospectively studying the association between guideline compliance and clinical outcome in high volume joint replacement centres in Australia. Helen's project is being funded by a large competitive grant from the HCF Research Foundation.

### **Elizabeth Armstrong**

Elizabeth Armstrong was appointed in 2012 as Registry Manager to oversee the many registry-based projects being developed and managed through WORC. Elizabeth has brought the Arthroplasty Clinical Outcomes Registry (ACORN) to fruition and holds a key role with the ANZ Hip Fracture Registry.

### **Deanne Jenkin**

Deanne Jenkin joined WORC as a project manager for a study funded through a competitive grant from the Motor Accidents Authority looking at opioid dependence after motor vehicle trauma. Deanne has enrolled as a Masters student but plans to extend her research to include opioid therapy before and after total joint replacement surgery, and plans to convert her Masters project into a PhD in 2014.

### **Mark Buhagiar**

Mark Buhagiar is a physiotherapist and PhD student at the Whitlam Orthopaedic Research Centre whose project involves a multicenter randomised trial on home-based versus inpatient rehabilitation following total knee replacement surgery. Mark was the winner of the Ingham Institute 3-minute thesis award in 2013. Mark's project has received funding through a competitive grant from the HCF Research Foundation.

### **Manit Arora**

Manit Arora undertook a Masters by research in 2012/2013. He conducted surveys of orthopaedic registrars and surgeons, exploring the incidence of, and predictive factors for burnout and job satisfaction.

### **Jane Wu**

Jane Wu is a rehabilitation physician who is undertaking a PhD co-supervised by Professor Harris. Her research is a trial of early rehabilitation intervention in acutely injured patients.

### **Yasser Khatib**

Yasser Khatib is an orthopaedic surgeon who began his PhD at WORC in 2013. His project will cover psychosocial predictors of outcome after total knee replacement surgery.

### **Abhinav Aggarwal**

Abhinav Aggarwal undertook a Masters project examining patient preferences regarding variables in hip fracture surgery. The project involved surveying hip fracture patients and was completed in 2013.

# WORC Administrative Staff

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## **Tamara Gommermann**

Tamara started at Liverpool Hospital in 1994, commencing work with the Orthopaedic Department in 1998. Her position involves managing Professor Harris' clinical practice and managing the day to day running of the Liverpool Hospital Orthopaedic Department.

## **Jasmina Kosev**

Jasmina replaced Tamara in 2013 during her maternity leave, taking over her role as department secretary and personal assistant to Professor Harris.

## **Shirley Cross**

Shirley Cross is the academic secretary for Professor Ian Harris and the orthopaedic department. Her role is to coordinate the various research activities undertaken, and to liaise with industry and collaborators.

# Research Activities in 2012-2013

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## **Spine surgery outcomes in a workers' compensation cohort**

Harris IA, Dantanarayana N, Naylor JM.

Lumbar spine surgery (fusion, disc replacement or decompression) is common, yet indications are unclear and outcomes, particularly in a workers' compensation setting, are not consistently favourable. This study aimed to determine the outcomes of spine surgery in an Australian workers' compensation cohort. A retrospective review of prospectively collected data from WorkCover NSW and insurer agents was performed. Subject were included if they had lumbar spine decompression, fusion or disc replacement procedures performed between 1 January 2004 and 31 December 2006 (inclusive). Main outcome measures were; need for further lumbar spine surgery, return to work, return to pre-injury duties, and need for ongoing physical treatment or prescription opioids. All outcomes were measured at 24 months post surgery. 476 patients who had undergone lumbar spine surgery

within the workers' compensation system. The revision surgery rate was 9.2%. The return to work rate, and return to pre-injury duties rate, were 50.3% and 14.2%, respectively. The proportion of patients still undergoing treatment was 77.7%. The rates of return to work (or pre-injury duties) and need for ongoing treatment were significantly worse in patients undergoing fusion and disc replacement, compared to patients undergoing decompressive procedures (laminectomy, discectomy).

The findings do not support the use of lumbar spine fusion or disc replacement surgery as a method of achieving return to work and relief of pain in patients treated under workers' compensation.

**Status:** Completed.

**Published:** ANZ J Surg, 2012;82(9):625-9

## **Tourniquet application only during cement fixation in total knee arthroplasty: a double-blind, randomized controlled trial**

Mittal R, Adie S, Harris IA, Naylor JM, Ko V, Dave J, Dave C, Dietsch S, Hackett D, Ngo D.

This study proposed to establish whether tourniquet application during cement fixation and setting only (Short Duration) was associated with better functional recovery compared to standard tourniquet (Long Duration) application during total knee arthroplasty. We planned to randomise 230 patients to receive short or long duration tourniquet application. The primary outcomes were in-hospital donor transfusion rate and the Oxford Knee Score at 10 weeks post-surgery. Serial measures (pre-operative, day 4

then 2, 10, 26 and 52 weeks post-operation) of knee range and function were undertaken. Pre- and post-operative Doppler ultrasounds were obtained. Interim analysis indicated that risk of transfusion was greater in the Short Duration Group. Enrolment was discontinued after randomisation of 65 patients. Final follow-up of participants is underway.

**Status:** Completed.

**Published:** ANZ J Surg, 2012;(6):428-33

## Satisfaction with joint replacement in public vs private hospitals: a cohort study

Adie S, Dao AT, Harris IA, Naylor JM, Mittal R.

**Introduction:** In Australia, the majority of total knee and hip replacement surgeries occur in the private sector. Outcome-based research needs to be inclusive of this sector if the findings are intended to reflect the broader picture. This study compares outcomes up to 1 year post knee and hip replacement between patients treated in the public and private sectors. **Methods:** A prospective, observational study was performed in four high-volume joint replacement centres: two public, two private. Experienced orthopaedic surgeons contributed via their public and private practices. Knee and hip patients were recruited preoperatively. Self-reported questionnaires were completed preoperatively and at 6 and 12 months post-operatively. The primary outcome was satisfaction with surgery. Secondary outcomes included Oxford score, and SF-36 physical and mental component summary scores. Regression modeling was performed to adjust for potential confounders.

**Results:** Three hundred and thirty-one patients (184 public, 147 private; 215 knees, 116 hips) were recruited, with 6- and 12-month follow-up rates of 95% and 89%, respectively. Satisfaction rates were high in both public and private patients (approximately 90%) at 6 and 12 months, but private patients were less likely to be satisfied after adjusting for the strong effect of patient expectation. For both hip and knee cohorts, no between-sector differences were found in either the magnitude or rate of improvement in Oxford score or quality of life post-operatively. **Discussion:** Joint replacement outcomes are similar for patients treated in public and private hospitals. Surgeons should manage patient expectation prior to surgery, particularly in private patients.

**Status:** Completed

**Published:** ANZ J Surg, 2012;82(9):616-24

## Improvements in knee range and symptomatic and functional behaviour after knee arthroplasty based on pre-operative restriction in range

Naylor JM, Yeo AT, Mittal R, Ko V, Harris IA.

Recovery of knee range and Oxford Knee Score post knee arthroplasty based on preoperative knee range is described. A total of 191 patients recruited across 5 hospitals were assessed preoperatively, at 8 weeks postoperatively and 1 year. Preoperative knee range was categorized into "low" ( $\leq 109$ ), "moderate" ( $> 109$  to  $\leq 120$ ), and "high" ( $> 120$  degrees) flexion and "normal" ( $\pm 5$ ) and "restricted" ( $> +5$  degrees) terminal extension. Recovery was analyzed using MIXED modeling procedures. The low-flexion group gained flexion across time. The moderate-flexion and high-flexion groups lost flexion initially then

recovered, but 1-year flexion remained lower than preoperative values. The restricted terminal extension group gained extension across time. The normal terminal extension group lost extension initially then recovered to preoperative values at 1 year. Recovery in Oxford score was independent of preoperative knee range limitation. Improvement in knee range postoperatively, but not self-reported behavior, is highly dependent on the initial restriction in range.

**Status:** Completed

**Published:** Journal of Arthroplasty, 2012;27(6):1100-05

## Non operative versus operative treatment for thoracolumbar burst fractures without neurological deficit: a meta-analysis

Gnanenthiran SR, Adie S, Harris IA.

Decision-making regarding nonoperative versus operative treatment of patients with thoracolumbar burst fractures in the absence of neurologic deficits is controversial, and evidence from trials is sparse. The subsequent lack of evidence based practice may result in patients being treated inappropriately and being exposed to unnecessary adverse consequences. We therefore performed a systemic review incorporating meta-analysis to compare nonoperative and operative management of thoracolumbar burst fractures without neurological deficit for the following outcomes: (1) pain

(visual analog scale [VAS]); (2) function (validated Roland Morris Disability Questionnaire [RMDQ]); (3) kyphosis (degrees); (4) complications; (5) return to work; and (6) cost. Four trials were identified, including two RCTs consisting of 79 patients (41 with operative treatment and 38 with nonoperative treatment). The mean followup times range from 24 to 118 months. Based on individual patient data from RCTs, we found no between-group differences in baseline pain, kyphosis, and RMDQ scores. At last follow up, there were no between-group differences in pain, RMDQ scores, and return to work rates,

including results from sensitivity analyses. There was an improvement in kyphosis of 12.8° to 11° in the operative group, but surgery also was associated with increased complication rates and costs. Operative management of thoracolumbar burst fractures without neurological deficit may improve residual kyphosis, but

given the limitations of the study methodology, do not appear to improve pain or function at an average of four years after injury.

**Status:** Completed.  
**Published:** Clinical Orthopaedics and Related Research, 2012;470(2):567-77

## **Comparison of tibial bone coverage of six knee prostheses: a magnetic resonance imaging study with controlled rotation**

Wernecke G, Harris IA, Houang M, Seeto B, Chen D, Macdessi S.

Tibial prosthesis design varies, often in an attempt to improve tibial bone coverage in total knee replacement. The 6 most commonly used tibial prosthesis designs on the Australian Joint Registry (2009) were superimposed on MR images of 101 patients to assess tibial component overhang, underhang and coverage. Only 28.2% of all prostheses showed optimal posterolateral fit and 48.8% were oversized enough to cause popliteus impingement. One of the symmetric designs had the largest number of optimally fitting prostheses

while the asymmetric design had the greatest coverage (88%) and also the largest amount of posterolateral overhang. All 6 designs had over 80% tibial bone coverage.

The asymmetric prosthesis in the analysis offers improved bone coverage at the expense of tray overhang when compared to the symmetric designs.

**Status:** Completed.  
**Published:** Journal of Orthopaedic Surgery, 2012;20(2):143-7

## **Validating tests of functional ambulation after total knee replacement**

Ko V, Naylor J, Yeo AET, Harris IA, Crosbie J.

This prospective study aims test the repeatability and validity of a 30-minute walk test, to compare performance in patients 12 – 18 months after total knee replacement and in healthy age-matched controls, and to validate the test against current standards: the 6 minute walk test and

the Timed up-and-go test.

The 75 participants were: 32 post knee replacement patients and 43 healthy age-matched controls. Thirty-minute walk distance was significantly shorter amongst patients compared to healthy subjects (median 2862 m,

95% CI 2632 to 3063 m vs median 3066 m 95% CI 2992 m, to 3145 m,  $p < 0.001$ ). Test-retest repeatability was high (ICC = 0.98, 95% CI 0.96 to 0.99). Amongst patients, correlations between the 30-minute walk distance and the shorter tests were strong (six-minute walk test,  $r = 0.97$ ,  $p < 0.001$ ; Timed up-and-go test,  $r = 0.82$ ,  $p < 0.001$ ). Multiple regression modeling found six-minute walk distance to be the only significant predictor ( $p < 0.001$ ) of 30-minute walk distance, explaining 96% of the variability. Only Timed up-and-go significantly

predicted WOMAC function. Though a 30-minute walk test is highly repeatable, it adds little further information than the six-minute walk test, and the Timed up-and-go provides superior predictive ability for self-reported function. This study supports the utility of the more typical (shorter) walk tests used to measure functional ambulation after knee replacement.

**Status:** Completed. Manuscript in preparation.

## The Australian arthroplasty thromboprophylaxis survey

Molnar RB, Jenkins D, Millar M, Campbell T, Harris IA.

Australian orthopaedic surgeons were surveyed to determine their current use of thromboprophylaxis in joint replacement surgery in light of current controversies and practice variation. 593 surgeons participated in the survey. The use of mechanical and chemical prophylaxis was nearly universal for hip and knee replacement surgery. However, there was variation

in the duration of therapy, the type of chemical prophylaxis used, and the reasons given. Comparisons are made with similar surveys from other countries.

**Status:** Completed.

**Published:** Journal of Arthroplasty, 2012;27(2):175-8

## The effect of a single passive intervention to improve patient satisfaction in an orthopaedic service

Arora M, Harris IA, McEvoy L, Mittal R, Naylor JM.

Patient satisfaction is a goal of effective health care delivery and its assessment is important to the improvement of health care, especially in the context of a more consumerist culture. Patient education and information has been shown to improve patient satisfaction with care. Lack of sufficient patient information

(specifically related to post-discharge care) was identified in our patient population by means of a broad ranging post-discharge satisfaction survey. Targeted intervention, in the form of a discharge information sheet for patients, was trialed with the aim of improving specific satisfaction parameters related to post-discharge



care, and overall patient satisfaction. Patient satisfaction was measured for six months before and after the intervention, and data from both groups compared. There was no statistically significant difference in patient satisfaction directly related to the provision of the additional discharge information or overall patient satisfaction between the two groups. Providing patients with specific information alone at discharge is not sufficient to improve overall or

discharge-specific patient satisfaction. More active interventions may be required.

**Status:** Completed  
**Published:** Open Journal of Orthopaedics, 2012;2(2):30-33

## **A survey of opioid dependence after orthopaedic trauma**

Turner D, Harris IA, Naylor J

Opioid dependence post-surgery can lead to dependence, and has been linked to death from overdose, particularly in the United States. Opioid usage is increasing, yet the long term use of opioids for non-cancer pain has been questioned. We

aim to survey patients immediately, and 6 and 12 months post orthopaedic injury to determine the rate of opioid use, and the incidence of opioid dependence.

**Status:** In Progress.

## **CROSSBAT (Combined Randomised and Observational Study of Surgical for type B Ankle fracture Treatment)**

Mittal R, Harris IA, Naylor JM, Adie S.

A recent survey of orthopaedic surgeons conducted at our unit showed considerable practice variation in the treatment of common fractures, including the common isolated type B fibula fracture of the ankle. This multicentre randomized trial in being conducted in 22 centres across 6 states and territories in Australia, and New Zealand. Patient are randomised to operative or non-operative

treatment and patients (or surgeons) who do not wish to participate are offered follow up in the observational arm of the study. Recruitment began in 2010 and finished in 2013. The study has been supported with a grant from the Australian Orthopaedic Association.

**Status:** In progress

## Factors influencing patient participation in randomised trials of surgery

Mittal R, Harris IA, Naylor J, Adie S.

Recruitment in surgical trials, particularly those comparing operative to nonoperative treatment, are associated with low recruitment rates. Patient not wishing to be randomized for the ongoing CROSSBAT study (see above) are invited to complete a

questionnaire explores the reasons why they declined participation. This information may help shape future surgical trials in order to improve recruitment.

**Status:** In progress

## Patient preference for the surgical treatment of hip fractures in the elderly

Aggarwal A, Harris IA, Naylor JM, McEvoy L.

The operative treatment of hip fractures in the elderly is conducted variably, due to variable weighting placed by the surgical team regarding the importance of factors such as the desirability of using routine theatre time versus emergency time, consultant supervision, in-hours

operating, and complications associated with delays in accessing theatre, and with surgery cancellations. This study aims to measure the importance of these factors to patients with acute hip fractures.

**Status:** Completed, under review

## A multicentre randomised double blind placebo controlled study to determine the efficacy, safety and tolerability of AMG 785 in adults with fresh unilateral intertrochanteric fracture of the proximal femur.

Harris IA.

This international, industry sponsored trial is designed to determine the effect of a new drug on the healing of hip fractures. Liverpool Hospital is one

of the recruiting centres.

**Status:** Completed

## **CONSORT compliance in surgical randomised trials: are we there yet? A systematic review.**

Adie S, Harris IA, Naylor JM, Mittal R.

In other fields of medicine, it has been shown that studies with higher ratings of methodological quality, and therefore less prone to bias, have results that show interventions to be less effective than other studies. This study explores the reporting of

randomised trials in orthopaedic surgery, and the association between methodological quality and outcome.

**Status:** Completed

**Published:** Annals of Surgery, 2013; 258(6):872-878

## **Use of a reinforced injectable calcium phosphate bone cement in the treatment of tibial plateau fractures**

Harris IA.

This industry sponsored multicentre trial is designed to determine the safety and efficacy of a new, reinforced, injectable calcium phosphate cement as a void filler and

structural support in patients with tibial plateau fractures.

**Status:** Completed, manuscript in preparation.

## **One-to-one therapy is not superior to group- or home-based therapy after knee arthroplasty: A randomized, superiority trial.**

Ko V, Naylor JM, Harris IA, Mittal R, Crosbie J, Yeo AET.

The mode of delivery of rehabilitation after total knee replacement varies. This prospective randomized trial compared 3 common modalities used after knee replacement surgery. 249 patients were recruited from the participating institutions and randomised to one of the three treatment arms. Follow up was for 12

months. Outcomes included WOMAC function and pain, timed mobility, knee range of motion, and satisfaction with physiotherapy. No significant between-group differences were found.

**Status:** Completed

**Published:** Journal of Bone & Joint Surgery (Am), 2013;95(21):1942-9.

## **Complications of total hip replacement in patients with renal disease: a systematic review and meta-analysis**

Lieu D, Mittal R, Naylor JM, Harris IA, Abdrazak F.

Total hip replacement is a common procedure in patients with renal disease. This systematic review aims to compare the outcomes of this procedure in renal patients, to the outcomes in the general population undergoing this procedure. Studies providing outcome data after total hip replacement on patients who

are receiving renal dialysis or those who have undergone a renal transplant were found and data extracted.

**Status:** Completed.

**In press:** Accepted for publication by the Journal of Orthopaedic Surgery.

## Randomised trial support for orthopaedic surgical procedures

Lim HC, Adie S, Naylor JM, Harris IA.

Evidence levels supporting surgical practice are considered to be poor and lower than other fields of medicine. This study collected data on all orthopaedic procedures performed in three metropolitan hospitals, and the electronic literature was searched for randomised controlled trials (RCTs)

comparing each intervention to non-operative treatment. The degree to which orthopaedic procedures are supported by high level evidence is low, with many procedures not supported by RCT evidence.

**Status:** Completed, under review.

## A systematic review of the diagnostic preference of orthopaedic physical examination tests of the hip

Rahman LA, Adie S, Naylor JM, Mittal R, So S, Harris IA.

There is a paucity of information regarding the diagnostic performance of many physical tests of the hip. This systematic review aims to outline and evaluate the validity of the evidence for physical tests of the adult hip in orthopaedics.

A systematic search of Medline, Embase, Embase Classic, CINAHL and the Cochrane Library was conducted using keywords relevant to the diagnostic accuracy of orthopaedic tests of the hip. Methodological quality was assessed using a modified version

of the Quality Assessment of Diagnostic Accuracy Studies (QUADAS) tool. Sensitivity, specificity, predictive values, and likelihood ratios for each test were reported. The tests were then ranked and categorised according to their positive and negative likelihood ratios. 112 articles met our inclusion criteria with 16 containing methodologically acceptable data relating to 65 independent physical test-pathology combinations. The best performing tests were the patellar-pubic percussion test (also called the 'auscultatory percussion technique')

for detecting hip fractures and the hip abduction sign for detecting sarcoglycanopathies in patients with muscular dystrophy. In most cases, there was insufficient data to make

conclusive recommendations about the clinical utility of the physical tests.

**Status:** Completed.

**Published:** BMC Musculoskeletal Disorders, 2013; 14:257

## **Trends in knee arthroscopy and subsequent arthroplasty in an Australian population: a retrospective cohort study**

Harris IA, Madan NS, Naylor JM, Chong s, Mittal R, Jalaludin BB.

This study explored trends in knee arthroscopy rates in an Australian population between 2000 and 2008 and the relationship between knee arthroscopy and subsequent total knee arthroplasty (TKA).

The Centre for Health Record Linkage (CHeReL) was used to obtain data from the NSW Admitted Patient Data Collection between 2000 and 2008. The Australian Classification of Health Intervention procedure codes were used to identify participants. NSW population data from the Australian Bureau of Statistics was used to determine intervention rates.

Knee arthroscopy rates increased by 5% ( $p < 0.001$ ) in private hospitals and remained relatively steady in public hospitals. Rates increased for the 45-54, 55-64 and 65-74 ( $p < 0.001$ ) year-old age groups, decreased for <25, 25-34 and 35-44 ( $p < 0.001$ ) year-old

age groups and remained unchanged for the  $\geq 75$  year old age group. Rates of readmission for TKA within 24 months of knee arthroscopy decreased from 9.2% to 6.8% ( $p < 0.0001$ ) between 2000 and 2006. Compared to the younger age groups, the rate of readmission for TKA within 24 months was higher for those aged 65 or older at the time of arthroscopy, but this rate also decreased from 21.4% in 2000 to 16.9% in 2006 ( $p < 0.0001$ ). There was an increase in rates of knee arthroscopy in private hospitals and older age groups. The rate of conversion to TKA within 24 months of arthroscopy for those aged 65 years and older averaged 19%.

**Status:** Completed

**Published:** BMC Musculoskeletal Disorders, 2013;14

## **Introductory insights into patient preferences for outpatient rehabilitation after total knee replacement: implications for practice and future research**

Naylor JM, Mittal R, Carroll K, Harris IA

Knee range of motion (ROM) at the point of discharge from acute care is used as a clinical indicator to benchmark performance between

hospital services after total knee replacement (TKR). The utility of the current benchmark, including whether discharge ROM varies between

hospitals, is unknown. This study aimed to determine whether the benchmark [ $\geq 80$  degrees flexion and  $\leq 5$  degrees fixed flexion (extension)] is realistic and whether the service provider is a predictor of knee ROM.

A prospective, observational cohort study was conducted involving 176 TKR patients from four hospitals. Knee ROM was photographically assessed preoperatively and at discharge.

'Hospital', typical patient demographic data and preoperative ROM were identified a priori as potential predictors of knee ROM.

Overall, 2% [95% CI (confidence interval) 1-6] of patients attained the ROM benchmark. Individual hospital attainment of the benchmark ranged 0-7% with a significant difference ( $P = 0.047$ ) evident between the best performer and the remaining hospitals. The overall rates of attainment of the individual flexion (25%, 95% CI 19-32) and extension (15%, 95% CI 10-21) components were similarly low, although the scatter between hospitals was large [flexion (2-47%); extension (8-44%)].

Preoperative flexion and hospital were significant ( $P = 0.002$ ) predictors of discharge flexion, explaining 21% of the variance. Similarly, hospital and preoperative extension together with gender were significant ( $P < 0.001$ ) predictors of discharge extension, explaining 26% of the variance.

A small minority of patients attained the knee ROM benchmark, indicating the existing standard is unrealistic. Nevertheless, that 'hospital' is an important predictor confirms the potential of ROM for benchmarking purposes. Differences in physiotherapy practices may contribute to inter-hospital variation in discharge knee ROM together with other undefined factors. The causal relationships explaining the variation and the relationship between discharge ROM and longer-term outcome are avenues for future exploration which will help define the clinical relevance of the indicator.

**Status:** Completed.

**Published:** Journal of Evaluation in Clinical Practice, 2012;18(3):586-92.

## Is discharge knee range of motion a useful and relevant clinical indicator after total knee replacement? Part 1

Naylor JM, Ko V, Rougellis S, Green N, Hackett D, Magrath A, Cho A.

Knee range of motion (ROM) at discharge from acute care is used as a clinical indicator following total knee replacement (TKR) surgery. This study aimed to assess the clinical relevance of this indicator by determining whether discharge knee ROM predicts longer-term knee ROM and patient-reported knee pain and function. A total of 176 TKR recipients were prospectively followed after discharge

from acute care. Outcomes assessed included knee ROM and Oxford knee score post rehabilitation and 1 year post surgery. Discharge ROM and other patient factors were identified a priori as potential predictors in multiple linear regression modeling. A total of 133 (76%) and 141 (80%) patients were available for follow-up post rehabilitation [mean postoperative week 8.1 (SD 2.7)] and

at 1 year [mean postoperative month 12.1 (SD 1.4)], respectively. Greater discharge knee flexion was a significant ( $P < 0.001$ ) predictor of greater post-rehabilitation flexion but not 1-year knee flexion ( $P < 0.083$ ). Better discharge knee extension was a significant predictor of better post-rehabilitation ( $P = 0.001$ ) and 1-year knee extension ( $P = 0.013$ ). Preoperative Oxford score and post-rehabilitation knee flexion independently predicted post-rehabilitation Oxford score, and gender predicted 1-year Oxford score. Discharge ROM did not significantly predict Oxford score in either model. The finding that early knee range predicts longer-term range provides

clinical evidence favouring the relevance of discharge knee ROM as a clinical indicator. Although longer-term patient-reported knee pain and function were not directly associated with discharge knee ROM, they were associated with ROM when measured concurrently in the sub-acute phase. No causal effect has been demonstrated, but the findings suggest it may be important for physiotherapists to maximize range in the early and sub-acute periods.

**Status:** completed

**Published:** Journal of Evaluation in Clinical Practice. 2012;18(3):644-51.

## Is discharge knee range of motion a useful and relevant clinical indicator after total knee replacement? Part 2

Naylor JM, Ko V, Rougellis S, Green N, Mittal R, Heard R, Hackett D, Magrath A, Cho A, McEvoy L.

Knee range of motion (ROM) at discharge from acute care is used as a clinical indicator following total knee replacement (TKR) surgery. This study aimed to assess the clinical relevance of this indicator by determining whether discharge knee ROM predicts longer-term knee ROM and patient-reported knee pain and function. A total of 176 TKR recipients were prospectively followed after discharge from acute care. Outcomes assessed included knee ROM and Oxford knee score post rehabilitation and 1 year post surgery. Discharge ROM and other patient factors were identified a priori as potential predictors in multiple linear regression modelling. A total of 133 (76%) and 141 (80%) patients were available for follow-up post rehabilitation [mean postoperative week 8.1 (SD 2.7)] and at 1 year [mean postoperative month

12.1 (SD 1.4)], respectively. Greater discharge knee flexion was a significant ( $P < 0.001$ ) predictor of greater post-rehabilitation flexion but not 1-year knee flexion ( $P < 0.083$ ). Better discharge knee extension was a significant predictor of better post-rehabilitation ( $P = 0.001$ ) and 1-year knee extension ( $P = 0.013$ ). Preoperative Oxford score and post-rehabilitation knee flexion independently predicted post-rehabilitation Oxford score, and gender predicted 1-year Oxford score. Discharge ROM did not significantly predict Oxford score in either model. The finding that early knee range predicts longer-term range provides clinical evidence favouring the relevance of discharge knee ROM as a clinical indicator. Although longer-term patient-reported knee pain and function were not directly associated

with discharge knee ROM, they were associated with ROM when measured concurrently in the sub-acute phase. No causal effect has been demonstrated, but the findings suggest it may be important for

physiotherapists to maximize range in the early and sub-acute periods.

**Status:** Completed.

**Published:** Journal of Evaluation in Clinical Practice. 2012;18(3):652-8

### **Difficulties in establishing long-term trauma outcomes data collections. Could trauma outcomes be routinely monitored in New South Wales, Australia: piloting a 3 month follow-up?**

Mitchell R, Watson W, Harris IA, Curtis K, McDougall T.

Injuries represent a significant health burden in Australia. In New South Wales (NSW), no routine follow-up of post-injury health outcomes is conducted. This article describes the development of a protocol and the conduct of a pilot study to collect information on trauma outcomes at 3 months post-injury at two trauma centres. A modified Victorian model of trauma outcomes monitoring was adopted, with potential participants required to 'opt in' to the collection. Fifty-three percent of individuals contacted consented to opt in, with 75% of these completing an interview.

The data items collected were able to provide an indicator of the impact of trauma on individuals. This study has highlighted that there are important methodological issues to be addressed in terms of recruitment in establishing long-term trauma outcomes data collections that are representative of the trauma population. Ultimately, information from a long-term trauma outcomes collection could be linked to data collections to conduct research across the injury continuum.

**Status:** Completed.

**Published:** Injury, 2012;43(1):96-102.

### **Malrotation due to a design element of a new antegrade femoral nail**

Suthersan M, Harris IA, Suzuki A.

This paper describes a study of the use of a new form of intramedullary femoral nail, and how the spiral grooves on that nail can lead to malrotation during insertion.

**Status:** Completed.

**Published:** Internet Journal of Orthopedic Surgery, 2012;19(3)

### **Peri-articular Steroid Injection in Total Knee Arthroplasty: A Prospective, Double Blinded, Randomized Controlled Trial**



Chia SK, Wernecke GC, Harris IA, Bohm MT, Chen DB, MacDessi SJ.

Total knee arthroplasty is a painful operation. Peri-articular local anesthetic injections reduce post-operative pain and assist recovery. It is inconclusive whether intra-operative injections of peri-articular corticosteroids are of benefit. Therefore our clinical question was: in patients with osteoarthritis who are undergoing TKA, does the addition of high or low dose corticosteroid to peri-articular injections of local anesthetic and adrenaline improve post-operative pain and range of motion? We performed a prospective, double-blinded, randomized controlled trial of

two different doses of triamcinolone acetate (N = 42 in each group) added to local anesthetic in TKA for osteoarthritis. There were no significant differences in pain scores or ROM between the control and corticosteroid groups. Differences in secondary outcomes were also non-significant. Peri-articular corticosteroids do not appear to be of benefit in TKA.

**Status:** Completed.

**Published:** Journal of Arthroplasty, 2013; 28(4):620-623

## Arthroscopy to treat osteoarthritis of the knee?

Buchbinder R, Harris IA.

This editorial piece provides comment on an article describing arthroscopy rates in Victoria, but goes further. It criticizes the current persistence of the use of arthroscopic knee surgery in the presence of osteoarthritis, despite

good evidence from multiple studies showing its lack of effectiveness

**Status:** Completed.

**Published:** Medical Journal of Australia, 2012;197(7):364-5.

## Mortality rates after surgery in NSW

Harris IA, Madan A, Naylor JM, Chong S.

Studies have been conducted to determine 30-day and 365-day mortality rates after surgical procedures in different regions; however, there is a lack of data for mortality rates in New South Wales (NSW), Australia. The aim of this study was to determine 30-day and 365-day post-operative mortality rates after selected common operations

performed in NSW. Using the Centre for Health Record Linkage, we linked the NSW Admitted Patient Data Collection with the NSW Registry of Births, Deaths and Marriages and Australian Bureau of Statistics to retrospectively calculate 30-day and 365-day post-operative mortality rates for 21 selected surgical procedures between 2000 and 2009. One year

(365 days) standardized mortality ratios, and proportion of public and private hospital admissions and mortality, were calculated for each procedure.

Thirty-day mortality was lower than in previous studies for femur fracture fixation (3.7%), cervical spine fusion (0.8%), prostatectomy (0.2%), coronary valve replacement (4.2%), pulmonary resection (2.5%), bariatric surgery (0.07%) and pancreaticoduodenectomy (6.2%). Thirty-day mortality was higher than previously reported for abdominal aortic aneurysm (12.6%) and

tonsillectomy (0.02%). One-year mortality rates ranged from 0.2% for tonsillectomy and bariatric surgery, to 24.6% for hip fracture fixation.

Thirty-day mortality rates in NSW are similar, if not lower for most procedures when compared with rates reported in other studies. The reported mortality rates for each procedure allow clinicians and patients to be more informed of surgical risks.

**Status:** Completed.

**Published:** ANZ Journal of Surgery, 2012;82(12):871-7

## **Advances and future directions for management of trauma patients with musculoskeletal injuries.**

Balogh ZJ, Reumann MK, Gruen RL, Mayer-Kuckuk P, Schuetz MA, Harris IA, Gabbe BJ, Bhandari M.

Musculoskeletal injuries are the most common reason for operative procedures in severely injured patients and are major determinants of functional outcomes. In this paper, we summarise advances and future directions for management of multiply injured patients with major musculoskeletal trauma. Improved understanding of fracture healing has created new possibilities for management of particularly challenging problems, such as delayed union and non union of fractures and large bone defects. Optimum timing of major orthopaedic interventions is guided by increased knowledge about the immune response after injury.

Individual treatment should be guided by trading off the benefits of early definitive skeletal stabilisation, and the potentially life-threatening risks of systemic complications such as fat embolism, acute lung injury, and multiple organ failure. New methods for measurement of fracture healing and function and quality of life outcomes pave the way for landmark trials that will guide the future management of musculoskeletal injuries.

**Status:** Completed.

**Published:** The Lancet 2012; 380: 1109–19.

## **Discordance between patient and surgeon satisfaction after total joint arthroplasty.**

Harris AI, Harris AM, Naylor JM, Adie S, Mittal R, Dao AT

We surveyed 331 patients undergoing total hip or knee replacement pre-operatively, and patients and surgeons were both surveyed 6 and 12 months post-operatively. We identified variables (demographic factors, operative factors and patient expectations) as possible predictors for discordance in patient-surgeon satisfaction. At 12 months, 94.5% of surgeons and 90.3% of patients recorded satisfaction with the outcome. The discordance between patient and surgeon satisfaction was mainly due to patient dissatisfaction – surgeon

satisfaction. In an adjusted analysis, the strongest predictors of discordance in patient-surgeon satisfaction were unmet patient expectations and the presence of complications. Advice to potential joint replacement candidates regarding the decision to proceed with surgery should be informed by patient reported outcomes, rather than the surgeon's opinion of the likelihood of success.

**Status:** Completed.

**Published:** Journal of Arthroplasty, 2013; 28(5):722-727

## Burnout in orthopaedic surgeons: a review

Arora M, Diwan A, Harris IA

This paper reviews the literature on burnout and fatigue relating to orthopaedic surgery. As part of this Masters project, Manit Arora conducted a survey of orthopaedic surgeons and trainees in 2013, with

publication aimed at 2014.

**Status:** Completed

**Published:** ANZ Journal of Surgery, 2013; 83(7-8):512-515

## Cryotherapy following total knee replacement

Adie S, Kwan A, Naylor JM, Harris IA, Mittal R

A Cochrane systematic review represents the highest level of evidence available and this paper represents a significant body of work for those at Whitlam. After an exhaustive review of the available scientific literature, the authors conclude that the potential benefits of cryotherapy on blood loss, postoperative pain, and range of motion may be too small to justify its use, and the quality of the evidence

was very low or low for all main outcomes. This needs to be balanced against potential inconveniences and expenses of using cryotherapy. Well designed randomised trials are required to improve the quality of the evidence.

**Status:** Completed.

**Published:** Cochrane Database of Systematic Reviews 2012, Sept., issue

9. Art. No.:CD007911, 1-186

## **The Effect of a Single Passive Intervention to Improve Patient Satisfaction in an Orthopaedic Service**

Arora M, Harris IA, McEvoy L, Mittal R, Naylor JM

Patient satisfaction is a goal of effective health care delivery and its assessment is important to the improvement of health care, especially in the context of a more consumerist culture. Patient education and information has been shown to improve patient satisfaction with care. Lack of sufficient patient information (specifically related to post-discharge care) was identified in our patient population by means of a broad ranging post-discharge satisfaction survey. Targeted intervention, in the form of a discharge information sheet for patients, was trialled with the aim of improving specific satisfaction parameters related to post-discharge care, and overall patient satisfaction.

Patient satisfaction was measured for six months before and after the intervention, and data from both groups compared. There was no statistically significant difference in patient satisfaction directly related to the provision of the additional discharge information or overall patient satisfaction between the two groups. Providing patients with specific information alone at discharge is not sufficient to improve overall or discharge-specific patient satisfaction. More active interventions may be required.

**Status:** Completed.

**Published:** Open Journal of Orthopaedics, 2012;2:30-33

## **Can the Oxford scores be used to monitor symptomatic progression of patients awaiting knee or hip arthroplasty?**

Naylor JM, Kamalasena G, Hayen A, Harris IA, Adie S.

We report the week-to-week variation of the Oxford Knee and Oxford Hip Score (OKS, OHS) in individuals with severe osteoarthritis. People waitlisted for knee (n=51) or hip arthroplasty (n=52) were assessed twice, 1-week apart. There were no major week-to-week systematic biases in the scores. Limits of agreement (LOA) for both scores were wide (OKS, -9.5 to 6.6; OHS, -7.7 to 7). For most individual questions, the answers varied by  $\leq 1$  point in over 90% of participants. The week-to-week 95% LOA for the Oxford scores are unacceptably large, but

variations within the individual questions are minimal. Consequently, reference to variation in the individual questions may be more useful for monitoring a patient's preoperative clinical change than changes in the total Oxford score. We conclude that the total scores are not suitable for monitoring the progression of OA in individual patients.

**Status:** Completed.

**Published:** Journal of Arthroplasty, 2013; 28(9): 1454-1458

## Time to reconsider steroid injections in the spine?

Harris IA, Buchbinder R

In the light of recent deaths in the US from a contaminated batch of corticosteroids used for injections, the risks of spinal steroid injections, and the evidence for the lack of effectiveness over placebo is discussed. A call for withdrawal of

public funding for this ineffective, costly procedure is made.

**Status:** Completed.

**Published:** *Medical Journal of Australia*, 2013;199(4):237.

## The six-minute walk test is an excellent predictor of functional ambulation after total knee arthroplasty.

Ko VW, Naylor JM, Harris IA, Crosbie J, Yeo AE

The aim of this study were to compare the performance of TKA recipients in an extended walk test to healthy age-matched controls and to determine the utility of this extended walk test as a research tool to evaluate longer term functional mobility in TKA recipients. The mobility of 32 TKA recipients one year post-surgery and 43 healthy age-matched controls were assessed using the Timed Up and Go (TUG), Six minute walk test (6MW) and 30-minute walk (30MW) tests. The latter test was repeated one week later. Self-reported function was measured using the WOMAC Index and a physical activity questionnaire.

Though TKA recipients are able to walk for 30 minutes one year post-surgery, their performance falls significantly short of age-matched norms. The 30MW test is strongly predicted by 6MW test performance, thus providing strong construct validity for the use of the 6MW test in the TKA population. Neither a short nor long walk test is a strong predictor of patient-reported function after TKA.

**Status:** Completed.

**Published:** *BMC Musculoskeletal Disorders*, 2013,14:145

## PRECISE - Pregabalin in addition to usual care for sciatica: a randomised controlled trial. Study rationale and protocol.

Mathieson S, Maher CG, McLachlan AJ, Latimer J, Koes BW, Hancock MJ, Harris I, Day RO, Pik J, Jan S, Billot L, Lin CC.

This reports the protocol for an ongoing NHMRC funded study

comparing pregabalin (Lyrica) to placebo for patients with sciatica.

**Status:** Completed.

**Published:** Trials, 2013;14(1):213

## Effect of intra-articular injection of tranexamic acid on bleeding in total knee arthroplasty

Jang R, Macessi S, Chen D, Kao M, Harris IA

The effect on bleeding of varying dosages of intra-articular tranexamic acid (TXA, 1500mg and 3000mg) compared to a control group was studied in 166 patients undergoing primary total knee arthroplasty (TKA). Hemoglobin (Hb) levels were taken pre-operatively and on post-operative days one and two. TXA was more effective than no treatment, and the effective was stronger with the higher dose. The effect on bleeding of varying dosages of intra-articular

tranexamic acid (TXA, 1500mg and 3000mg) compared to a control group was studied in 166 patients undergoing primary total knee arthroplasty (TKA). Hemoglobin (Hb) levels were taken pre-operatively and on post-operative days one and two.

**Status:** Completed.

**In press:** Accepted by Journal of Arthroplasty

## Mail versus telephone administration for the Oxford knee and hip scores

Abdel Messih M, Naylor JM, Harris IA, Descallar J, Manickam M, Mittal R.

Telephone and postal methods of administration of the Oxford Knee Score (OKS) and the Oxford Hip Score (OHS) were compared on 85 and 61 patients undergoing total knee arthroplasty (TKA) and total hip arthroplasty (THA), respectively. The test for equivalence was significant for both the knee ( $P < 0.001$ ) and hip participants ( $P < 0.001$ ) indicating that the modes of administration yielded similar results. The ICCs of the OKS and OHS were 0.79 (95% Confidence Interval (CI) 0.70, 0.86) and 0.87

(0.79, 0.92) respectively. The 95% limits of agreement were wide for both scores (OKS LOA, -8.6, 8.2; OHS LOA, -7.7, 5.3). The two modes of administration of the OKS and OHS produce equivalent survey responses at a group level but the same method of administration should be constant for individual monitoring in a clinical setting.

**Status:** Completed.

**Published:** Journal of Arthroplasty, 2013; 29(3): 491-494

## **Total hip replacement in haemodialysis and renal transplant patients: a systematic review of the literature**

Lieu D, Harris IA, Naylor JM

Total Hip Replacement (THR) is one of the most successful interventions in orthopaedic practice. However the reported risks in patients with end-stage renal disease have varied widely. We performed a systematic review of the literature to determine the overall complication rate of THR in patients on either long-term haemodialysis or who have received a renal transplant.

25 studies involving 534 patients (755 hips) were included. Transplant patients were on average younger,

and more likely to receive an uncemented implant. THR provided good symptomatic relief, however all complication rates were increased in both groups, compared to previous reports of patients without renal failure. Haemodialysis patients had approximately twice the infection risk, and also a higher mortality rate, compared to transplant patients.

**Status:** Completed.

**In press:** Accepted by Journal of Orthopaedic Surgery

## **A Multi-planar CT-based Comparative analysis of Patient-Specific Cutting Guides with Conventional Instrumentation in Total Knee Arthroplasty**

Marimuthu KM, Chen D, Macdessi S, Harris IA, Wheatley E, Bryant CJ.

Patient specific guides (PSGs) are postulated to improve the alignment of components in total knee arthroplasty. Three hundred consecutive total knee arthroplasties performed with either conventional (CON) (n = 185) or Visionaire PSG (n = 115) were evaluated with a CT protocol for coronal limb alignment, coronal and sagittal alignment of individual components and femoral component rotation.

There was no statistically significant difference between the two groups in

any of the above parameters. In addition, no difference was found in total operative time. PSGs do not offer any benefit over conventional guides in terms improving the coronal alignment of the limb or alignment of individual components.

**Status:** Completed.

**Published:** Journal of Arthroplasty, <http://dx.doi.org/10.1016/j.arth.2013.12.019>.

## **A comparison of alignment using patient specific guides, computer navigation and conventional instrumentation in total knee arthroplasty**

Macdessi S, Jang R, Harris IA, Wheatley E, Bryant C, Chen D.

This study used data from 260 patients undergoing total knee replacement surgery using three different techniques: conventional instrumentation, patient-specific cutting guides and computer

navigation. The latter two techniques showed more consistent alignment than the conventional technique.

**Status:** Completed.

**Published:** Knee, 2013; 21(2)

## **Researching the reliability of accreditation survey teams: lessons learnt when things went awry**

Greenfield D, Pawsey M, Naylor JM, Braithwaite J.

Accreditation of health organisations, occurring in over 70 countries, is predicated upon the reliability of survey teams judgements, but we do not know the extent to which survey teams are reliable. To contribute evidence to this issue, we investigated the reliability of two survey teams simultaneously assessing an organisation. The setting was a large Australian teaching hospital, and data were derived from interviews, observations and survey documents. Participants were from four groups: hospital staff, accreditation agency personnel and surveyors, and research staff. Thematic analysis was employed to identify significant factors that influenced the study. The two survey teams ratings and recommendations demonstrated high levels of agreement. However, while a common understanding of the study existed,

the research was compromised. There were difficulties enacting the study. Contrary to negotiated arrangements, the pressure of the study resulted in surveyors discussing evidence and their interpretation of standards. Uncontrollable circumstances (late changes of personnel), and unexpected events (a breakdown of working relationships), challenged the study. The twin lessons learnt are that a consistent survey outcome is likely to be reached when reliability of process and consistent application of standards are pursued, and research requires negotiating challenges and relationships.

**Status:** Completed

**Published:** Health Information Management Journal, 2013; 42(1): 4-10

## **Hospital inpatient versus home-based rehabilitation after knee arthroplasty (the HIHO study): study protocol for a randomized controlled trial**

Buhagiar MA, Naylor JM, Kohler F, Harris IA, Xuan W, Wright RJ, Fortunato R.

Formal rehabilitation programs are often assumed to be required after total knee arthroplasty to optimize patient recovery. Inpatient

rehabilitation is a costly rehabilitation option after total knee arthroplasty and, in Australia, is utilized most frequently for privately insured



patients. With the exception of comparisons with domiciliary services, no randomized trial has compared inpatient rehabilitation to any outpatient based program. The Hospital Inpatient versus HOme (HIHO) study primarily aims to determine whether 10 days of post-acute inpatient rehabilitation followed by a hybrid home program provides superior recovery of functional mobility

on the 6-minute walk test (6MWT) compared to a hybrid home program alone following total knee arthroplasty. Secondly, the trial aims to determine whether inpatient rehabilitation yields superior recovery in patient-reported function.

**Status:** Completed.

**Published:** Trials, 14(1)

## **Heart rate response and factors affecting exercise performance during home- or class-based rehabilitation for knee replacement recipients: lessons for clinical practice**

Naylor JM, Ko V.

Patients undergoing total knee replacement (TKR) are typically de-conditioned and manifest medical comorbidities associated with a lack of fitness. Consequently, an argument exists for rehabilitation programmes to target cardiovascular fitness. Doubt exists, however, as to the capacity of TKR recipients to exercise intensely and effectively. This preliminary study aimed to: (1) determine whether patients participating in a home- or class-based exercise programme can exercise in their heart rate (HR) training zone, and (2) identify confounding factors influencing performance.

TKR recipients participating in exercise programmes can exercise moderately hard indicating a potential for rehabilitation to improve cardiovascular fitness. Whether individual fitness actually improves likely depends in part on therapist recognition of key modifiable factors. It is recommended that therapists use these observations to inform practice so patients extract the most benefit from their rehabilitation.

**Status:** Completed

**Published:** Journal of Evaluation in Clinical Practice, 2012; 18: 449-458

## Independent Learning Projects 2012/2013

*These projects were undertaken over 2012 as part of the Phase 2 medical school program at the University of New South Wales.*

### **Ashish Munsif**

Measuring prescription opioid dependence six months post-orthopaedic trauma in New South Wales, Australia: A pilot study for a trauma outcomes registry

### **Germaine Ong**

Short-term Complications in English-proficient and limited-English-proficient patients post total Hip and Knee Replacement

*These projects were undertaken over 2013 as part of the Phase 2 medical school program at the University of New South Wales.*

### **Kwong Min Leong**

Inter-rater reliability of registry data collection using ACORN data

### **Pratima Herle (Honors)**

A trial of tranexamic acid in hip fracture surgery

### **Kurt Seagrave**

Validation of ACORN registry data

### **Ian Ng**

Opioid dependence after orthopaedic trauma

# Community Engagement Activity March 2012

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This inaugural community engagement activity was attended by over seventy five people.

Vicki Ko presented findings from her PhD studies to study participants and their carers. Dr Justine Naylor presented work which subsequently built on Vicki's PhD findings.

#### Topics included

- Results from a randomized trial undertaken to test whether one to one physiotherapy rehabilitation was superior to group based or home based programmes
- The performance of TKR recipients one year post surgery compared to a healthy age-matched norm group in a thirty minute walk test
- Patient preferences for rehabilitation after joint replacement surgery

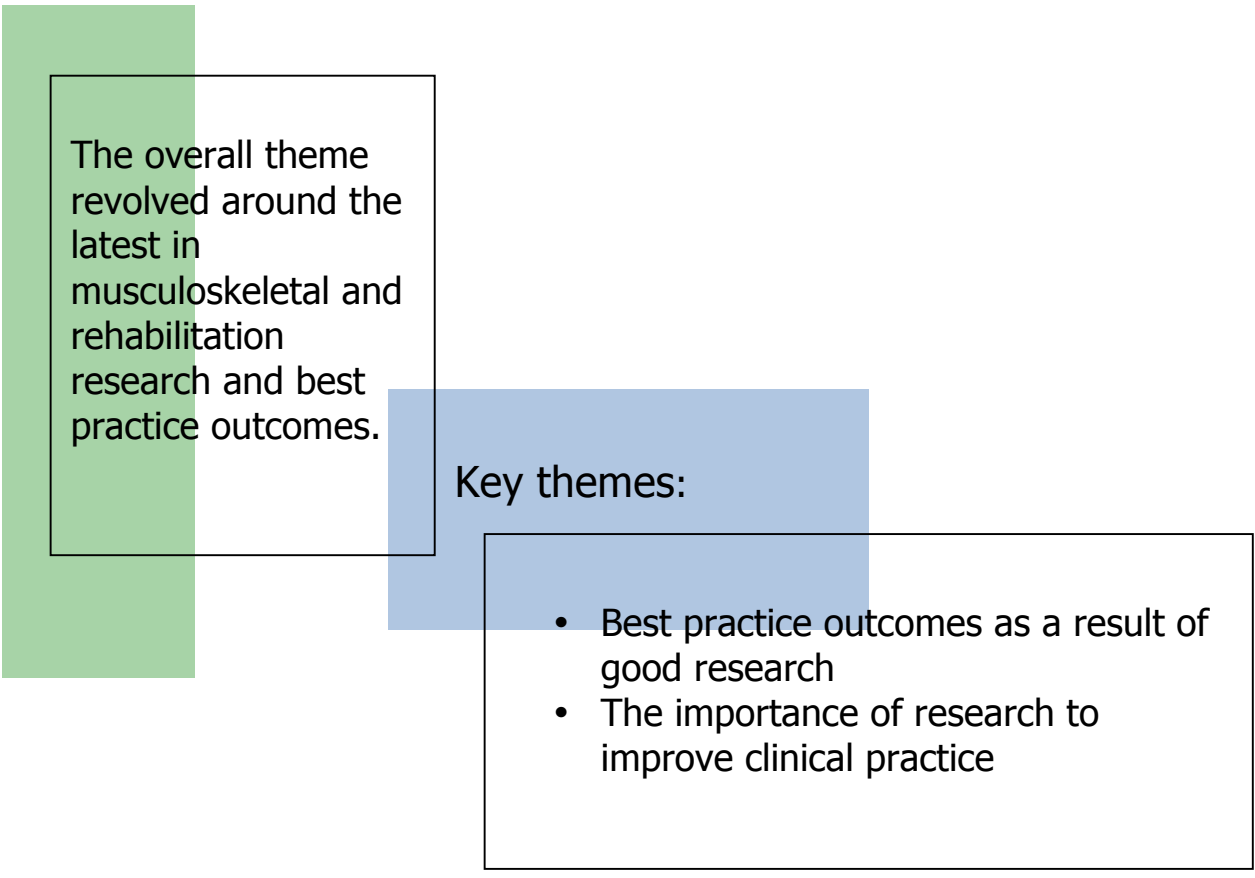


# The Whitlam Musculoskeletal and Rehabilitation Symposium 10<sup>th</sup> Aug. 2012

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This conference included participants from all over NSW from various disciplines. Guest speakers were Professor Zsolt Balogh (Director of Trauma, John Hunter Hospital. Discipline Head of Trauma, University of Newcastle), Professor Ian Cameron

(Rehabilitation Studies Unit Sydney Medical School, University of Sydney), and Associate Professor Jacqueline Close (Consultant Geriatrician, Prince of Wales Hospital. Neuroscience Research, University of New South Wales).



The overall theme revolved around the latest in musculoskeletal and rehabilitation research and best practice outcomes.

Key themes:

- Best practice outcomes as a result of good research
- The importance of research to improve clinical practice

## PROGRAM

### **Rehabilitation post hip fracture**

*Professor Ian Cameron*

### **A Review of causes for mortality in hip fracture patients**

*Professor Zsolt Balogh*

### **Emergency pelvic fracture management**

*Professor Ian Harris*

### **Free papers**

- Limited English proficiency is associated with greater risk of complications after Total Joint Replacement patients  
*Justine Naylor*
- Is a 30 minute walk test useful after a knee replacement?  
*Victoria Ko*
- Why don't all patients participate in randomised orthopaedic surgical trials?  
*Rajat Mittal*
- Revision and mortality after spine surgery  
*Ian Harris*
- Provision of hip precaution education at Concord Hospital: A review of Occupational Therapy practice  
*Clare Batkin & Bee Lan Tay*

### **National Hip Fracture Audit**

*A/Professor Jacqueline Close*

### **Patient satisfaction and complications after joint replacements (private vs public)**

*Dr Sam Adie*

### **Patient preference for rehabilitation post total knee replacement**

*Dr Justine Naylor*

### **Discordance between patient and surgeon satisfaction after joint replacement**

*Professor Ian Harris*

### **Elective total hip & knee replacements – A review of the evidence**

*Ms Elizabeth Armstrong*

### **Osteoarthritis Chronic Care Program**

*Ms Mary Fien*

## Free Papers

- Quality of life in older people after hip fracture: a meta-analysis  
*Yasin Shahab*
- Trends in arthroscopic knee surgery in NSW  
*Navdeep Madan*
- Mail vs telephone administration for Oxford Hip and Knee scores  
*Marena Abdel Messih*
- The evidence base for common surgical procedures  
*David Ma*
- A randomized double blind clinical trial evaluating the effects of daily controlled vibration on the strength and range of movement of a shoulder following a rotator cuff repair  
*Geoffrey Knightly*
- Mortality in major surgery in NSW  
*Aman Madan*



# Collaborations & Committee Representation

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## **Ingham Institute for Applied Medical Research**



The Whitlam Orthopaedic Research Centre (WORC) operates within the Ingham Institute for Applied Medical Research through a memorandum of understanding between the two institutions. The new Ingham Institute building became the home for WORC in 2012, and the research infrastructure and administrative support provided by the Ingham Institute has greatly enhanced the ability of WORC to perform its activities.

## **South Western Sydney Local Health District**



Centre for Research, Evidence Management Surveillance Unit  
 Orthopaedic Department, Fairfield and Liverpool Hospitals  
 Department of Trauma, Liverpool Hospital  
 Whitlam Joint Replacement Centre, Fairfield Hospital

## **Outside Sydney South West Area Health Service**

Professor Ian Cameron – Rehabilitation Studies Unit, University of Sydney  
 Orthopaedic Department, St George and Sutherland Hospitals  
 Dr Sam Macdessi – Sydney Knee Service, Kogarah  
 South Western Sydney Clinical School - Faculty of Medicine, UNSW



Professor Rachelle Buchbinder, Monash University  
 University of Newcastle  
 The George Institute

**During 2012-2013, members of WORC sat on the following committees:**

**Ian Harris**

- Hospital trauma committee member - Liverpool Hospital
- Human Research Ethics Committee member - Liverpool Hospital
- Member, AMSEC (Australian Musculo-skeletal Educational Competencies) - Providing core competencies for medical curricula
- Surgical Services Taskforce – Emergency Surgery Subgroup - NSW Health
- Co-chair, ACI (NSW Agency for Clinical Innovation) Musculoskeletal Network Elective Joint Replacement Model of Care Working Group - NSW Health
- Member, ACI Working Party, OACCP (Osteoarthritis Chronic Care Program) – NSW Health
- Member, FOHKS (Fairfield Orthopaedic Hip and Knee Service) Steering Committee - Fairfield Hospital
- Stream Director (Bone and Joint, Plastics, Neurosurgery, Maxillofacial, Ophthalmology, Trauma) South Western Sydney Local Health District, 2011 – present.
- Risk Management Committee, South Western Sydney Local Health District, 2011 - present

**Justine Naylor**

- Member, ACI Working Party, Elective Joint Replacement – NSW Health
- Member, ACI Working Party, OACCP (Osteoarthritis Chronic Care Program) – NSW Health
- Hospital Improvement Committee, WJRC (Whitlam Joint Replacement Centre) Representative and EQuIP Criterion Leader – Fairfield Hospital
- Member, Sydney South West Area Health Service BPMC (Area Blood Transfusion Committee) – Sydney South West Area Health Service
- Chair, Research Development Committee - Fairfield Hospital
- Member, FOHKS (Fairfield Orthopaedic Hip and Knee Service) Steering Committee - Fairfield Hospital



# Grants & Scholarships

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Project: Pregabalin in addition to usual care for sciatica (PRECISE): a randomised, placebo-controlled trial. APP1042073  
Funding body: NHMRC (Project grant)  
Amount: \$618,588.99  
Chief investigator: Christine Lin  
Date awarded: 19 October 2012  
Grant period: 3 years

Project: Investigating practice variation in hip and knee arthroplasty  
Funding body: HCF Research Foundation  
Amount: \$704,545  
Chief investigator: Justine Naylor  
Date awarded: January 2013  
Grant period: 3 years

Project: Opioid dependence in orthopaedic trauma patients  
Funding body: MAA  
Amount: \$211,931  
Chief investigator: Ian Harris  
Date awarded: October 2012  
Grant period: 3 years

Project: Trends of spinal stenosis surgery in Australia  
Funding body: Arthritis Australia  
Amount: \$15,000  
Chief investigator: Manuela Ferreira  
Role: Co-investigator  
Date awarded: 31 October 2013  
Grant period: 1 year

Project: Smoke-Free Recovery: RCT of a tailored online hospital and post-discharge smoking cessation program for orthopaedic trauma surgery patients  
Funding body: NHMRC (Partnership grant)  
Amount: \$358,000  
Chief investigator: Billie Bonevski  
Role: CID  
Date awarded: 23 October 2013

Grant period: 3 years  
Project: Consumer preferences for rehabilitation  
(FKHC/SWSLHD201387)  
Funding body: HCF Research Foundation  
Amount: \$43,440  
Chief investigator: Friedbert Kohler  
Date awarded: December 2013  
Grant period: 1 year

Project: HIHO: Hospital Inpatient vs Home Rehabilitation post TKR  
(FKHC/SWSLHD201386)  
Funding body: HCF Research Foundation  
Amount: \$140,463.42  
Chief investigator: Friedbert Kohler  
Date awarded: December 2013  
Grant period: 2 years

# Teaching Activities

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## **R.A.C.S. CLEAR (Critical Literature Evaluation And Research) Course**

Ian Harris

Melbourne, 1-2 November, 2012

Sydney, 8-9 February, 2013

## **AO Principles of Fracture Management**

Ian Harris

Shanghai, 1 – 3 September 2012

Xining, China, 5 – 7 September 2012

Indore, India, 17 – 19 March 2013

Bhubaneswar, India, 21 – 23 November 2013

## **AO Advances in fracture management**

Ian Harris

Chandigarh, India, 19 – 22 September, 2012

Sydney, 14 – 16 March, 2013

## **AO Faculty Education Program**

Ian Harris

Hong Kong, 1-3 June, 2012

Hong Kong, 17-18 August, 2013

## **AO Masters Course: Current Concepts**

Ian Harris

Dubai, UAE, 28 Sept – Oct 1, 2013

## **2<sup>nd</sup> Annual Whitlam Orthopaedic Research Centre Symposium**

Sydney, 10 August 2012

## **Physiotherapy Department, Liverpool Hospital**

Justine Naylor

Using tools to monitor change in physiotherapy

December, 2013

## **Physiotherapy Honours Program, University of Sydney**

Justine Naylor

Conducting RCTs in the real world

6 September, 2012

## **Supervision of Postgraduate Students**

### **Doctor of Philosophy, University of NSW**

Sam Adie

2008 – 2013

Primary supervisor: Professor Ian Harris  
 Associate supervisor: Professor Jonathan Craig  
 Thesis: Outcome bias in surgical literature  
 Sir Roy McCaughey Surgical Research Fellowship 2009 (RACS), \$60,000  
 Philip Segelov Award for Best Registrar Trauma Paper, AOA Annual Scientific Meeting, Cairns 2009

**Doctor of Philosophy, University of NSW**

Victoria Ko  
 2008 – 2013  
 Primary supervisor: Professor Ian Harris  
 Associate supervisor: Justine Naylor  
 Thesis: Effectiveness of rehabilitation following hip and knee replacement  
 UNSW Australian Postgraduate Award 2009 – 2011, \$20,427 p.a.  
 UNSW Research Excellence Award 2009 – 2011, \$10,000 p.a.  
 UNSW Rising Star Post Graduate Award 2009 – 2011, \$3,000 p.a.

**Doctor of Philosophy, University of NSW**

Rajat Mittal  
 2011 – 2015  
 Primary supervisor: Professor Ian Harris  
 Associate supervisor: Justine Naylor  
 Thesis: CROSSBAT; combined randomized and observational study of surgical in type B ankle fracture treatment.  
 AOA Research grant 2010 – 2012, \$35,337.50

**Doctor of Philosophy, University of NSW**

Mark Buhagiar  
 2012 – 2018  
 Primary supervisor: Justine Naylor  
 Associate supervisor: Professor Ian Harris  
 Thesis: HIHO: Hospital inpatient versus home program for rehabilitation after total knee replacement.

**Master of Surgery, University of NSW**

Manit Arora  
 2012 – 2013  
 Job satisfaction in orthopaedic surgeons  
 Dean's Award for Outstanding Research, 2013

**Doctor of Philosophy, University of NSW**

Jane Wu  
 2012 – 2018  
 Primary supervisor: A/Prof Chris Poulos  
 Associate supervisor: Professor Ian Harris  
 Early rehabilitation after acute injury or illness  
 RACP AFRM Research Development Scholarship 2013, \$30,000

**Doctor of Philosophy, University of NSW**

Yasser Khatib  
 2013 – 2019

Co-supervisors: Justine Naylor, Professor Ian Harris  
Mechanical and biopsychosocial predictors of outcome after total knee arthroplasty

**Doctor of Philosophy, University of NSW**

Helen Badge

2013 – 2016

Co-supervisors: Justine Naylor, Professor Ian Harris

Association between processes of care and outcome after hip and knee arthroplasty

**Master of Surgery, University of Sydney**

Abhinav Aggarwal

2013-2014

Patient preference for variables in hip fracture surgery

**Doctor of Philosophy, University of NSW**

Deanne Turner

2014 – 2018

Co-supervisors: Justine Naylor, Professor Ian Harris

Opioid-related harms in orthopaedic surgery