

# SCIENTIFIC PROGRAM



## SA/NT Branch Scientific Papers Day

21 February 2025  
SAHMRI, Adelaide



AOA

<b>12:45pm REGISTRATION AND LUNCH</b>		
<b>SESSION 1</b>		
<b>TIME</b>	<b>TITLE</b>	<b>PRESENTER</b>
1:25PM	WELCOME TO SCIENTIFIC MEETING & SESSION 1	<b>TOM GIEROBA</b>
1:30PM	CHRONIC OPIOID USE FOLLOWING HIP FRACTURE: A SYSTEMATIC REVIEW AND META-ANALYSIS	HUGO WALKER
1:40PM	DOES RELATIVE ANTEVERSION OR RETROVERSION CONTRIBUTE TO HIP INSTABILITY WITH CONTINUUM CUP SYSTEM?	LORENA BRASNIC
1:50PM	OUTCOMES OF NON-OPERATIVELY MANAGED VANCOUVER TYPE B PERIPROSTHETIC FEMUR FRACTURES: A RETROSPECTIVE COHORT STUDY	MITCHELL CREBERT
2.00PM	DO THE ORGANISMS FOR PJI VARY BETWEEN SOUTHERN, CENTRAL & NORTHERN AUSTRALIA?	MARIANA REGO
2:10PM	RESISTANCE TO ABRASIVE FORCE: A BIOMECHANICAL COMPARISON OF FOUR SUTURE MATERIALS COMMONLY USED IN ORTHOPAEDIC SURGERY	HUGO WALKER
2:20PM	SLIPPED CAPITAL FEMORAL EPIPHYSIS IN INDIGENOUS AUSTRALIAN POPULATION	JONGHOO SUNG
2:30PM	CLOSE OF SESSION 1	
2:40PM	SPONSOR TALKS	
<b>2:50PM</b>	<b>AFTERNOON BREAK</b>	
<b>SESSION 2</b>		
<b>TIME</b>	<b>TITLE</b>	<b>PRESENTER</b>
3:20PM	WELCOME TO & SESSION 2	<b>TOM GIEROBA</b>
3:25PM	SPONSOR TALKS	
3:35PM	PREVALENCE AND SEVERITY OF SACRAL DYSMORPHISM AND IMPLICATIONS FOR SAFE TRANSACRAL SCREW PLACEMENT IN THE INDIGENOUS AND NON-INDIGENOUS AUSTRALIAN POPULATION	JAMES VIRGIN
3:45PM	OUTCOMES AFTER ANKLE FRACTURES IN PATIENTS ON HAEMODIALYSIS FOR END-STAGE RENAL DISEASE: A DESCRIPTIVE STUDY	MIRUN THAYAPARAN
3.55PM	PATIENT AND INFECTION-RELATED PREDICTORS OF TREATMENT FAILURE AFTER TWO-STAGED TOTAL HIP REPLACEMENT REVISION FOR PROSTHETIC JOINT INFECTION: A RETROSPECTIVE COHORT STUDY	AMEYA BHANUSHALI
4:05PM	BARTON'S FINANCIAL	
4:15PM	CLOSE OF MEETING	
<b>4.20pm</b>	<b>GENERAL MEETING – MEMBERS ONLY</b>	

## Chronic Opioid use Following Hip Fracture: A Systematic Review and Meta-Analysis

1Health and Medical Sciences, University of Adelaide, Adelaide Health and Medical Sciences Building, 2Department of Orthopaedics and Trauma, Royal Adelaide Hospital, Adelaide, South Australia, Australia

HUGO WALKER MBBS; 1Arya Rao MBBS; 1Emily Marriott MBBS; 1,2Mr Peter J Smitham PhD, FRCS (Tr & Orth), FRACS

### Background

The burden of hip fractures is an increasing challenge to healthcare systems. The post-surgical period poses numerous challenges, with a key issue being analgesia titration. Despite increasing awareness of the dangers associated with opioid misuse disorder and the vulnerable patient demographic involved, clinicians continue to prescribe opioid agents for extended periods post-operatively. A systematic review of the literature was conducted to assess prevalence of chronic opioid consumption following hip fracture surgery and risk factors associated with chronic usage.

### Methods

PubMed, and Embase were systematically searched in November 2024 for articles of relevance and meta-analysis conducted. A standardised mean difference and confidence interval (CI) of 95% was calculated. An odds ratio (OR) was also calculated. Heterogeneity was assessed for using the  $I^2$  and  $\text{Chi}^2$  statistic.

### Results

Fourteen studies were included within this review. Rates of chronic opioid use following hip fracture ranged from 21.1% to 56% in the opioid exposed group. This prevalence was lower (6.3%-23%) in the previously opioid naïve group. Risk factors identified for engaging in chronic consumption included non-arthroplasty surgery (*OR, 0.76; 95% CI, 0.62-0.93,  $p = 0.009$* ), previous opioid exposure (*OR, 7.10; 95% CI, 2.90-17.41,  $p < 0.0001$* ), and a BMI >30 (*OR, 1.52; 95% CI, 1.10-2.08,  $p = 0.01$* ).

### Conclusion

High chronic consumption rates were identified among those previously opioid naïve. There remains significant concern regarding potential for exposure to prolonged adverse sedative effects in a vulnerable patient population. Clinicians should seek alternative analgesia in those at risk for transition to chronic consumption.

# Does Relative Anteversion or Retroversion Contribute to Hip Instability with Continuum Cup System?

Raigmore Hospital, Inverness, Scotland

LORENA BRASNIC, Colm Francis McGurk, Jun Wei Lim, Gerard Cousins

## Introduction

Hip dislocation is a common post-operative complication in total hip arthroplasty (THA) with the annual incidence of 1,9% in Scotland. Several contributing factors have been identified including cup malpositioning. Optimal angles of cup inclination and anteversion have historically been guided by Lewinnek safe zone (30-50 degrees for inclination and 5-25 degrees for anteversion). Implant features and surgical approach are also considered as contributors to cup stability. The Continuum cup system raised concerns due to a notable rate of dislocation, particularly when used with a neutral liner. This configuration exacerbates the reduced jumping distance of the femoral head, further compromising joint stability.

## Methods

Patients who underwent THA in the April 2023-2024 period were identified from theatre lists. Basic demographic patient data and notes on any post-operative complications were obtained from electronic patient records whereas operative details were acquired from operative notes. Post-operative radiograph was used to obtain radiographic measurements. Univariable logistic regression was used to determine the association of baseline risk factors and hip dislocation.

## Results

Data collected and analysed in this study is based on 251 primary THAs. The mean age of patients was 67,3 years (SD+/- 9,73) and 58,2% of the population were women. The average BMI of the patients was 28,4 (+/- 4,73). The overall incidence of dislocations was 4,00% and on average occurred 9 days post-operatively (3h–23 days). Radiographic measurements obtained from dislocated and non-dislocated THA were found not to be significantly different ( $p>0,05$ ). However, 50% of dislocated THA had radiographic angles outwit the 'safe zone'. THAs performed using antero-lateral approach had 5,7% rate of dislocation compared to 1,1% of THAs done by posterior approach.

## Conclusion

This study found that 50% of dislocations had radiographic angles out with the recognised safe zones. Antero-lateral approach was found to be associated with higher rates of dislocation and should be used with caution with the Continuum cup system.

## **Outcomes of Non-Operatively Managed Vancouver Type B Periprosthetic Femur Fractures: A Retrospective Cohort Study**

**Royal Prince Alfred Hospital, Sydney**

**MITCHELL CREBERT, Michael Le, Geoff Murphy, Annamaria Frangos Young, Robert Molnar, Daniel Franks, Michael Symes, Maurice Guzman**

**Introduction:** This retrospective case series evaluates outcomes in patients with Vancouver B1 periprosthetic fractures (PPFs) treated non-operatively. We specifically aimed to compare mortality rates between non-operatively and operatively managed patients, utilizing a matched cohort approach. Additionally, we examined the impact of weight-bearing status on mortality outcomes.

**Methods:** Thirty patients with Vancouver B1 PPFs managed non-operatively between 2011 and 2017 across five major Australian trauma centers were identified. These patients were propensity-matched to 30 operatively managed patients (ORIF or rTHA), matched by age, ASA score, length of stay, follow-up duration, and fracture sub-type (B1). Mortality rates at 30-days, 1, 5, and 10 years were compared between non-operative and operative groups. For the non-operative group alone, the impact of weight-bearing status on mortality was assessed.

**Results:** There was no significant difference in mortality rates between the non-operative and operative cohorts at 30-day (3.3%; 0.0%;  $P=2.14$ ), 1 year (20.0%; 0.0%;  $P=3.33$ ), 5 year (33.3%; 46.7%;  $P=0.56$ ) and 10 years (64.0%; 80.0%;  $P=0.19$ ). For the non-operative group alone, there was no significant difference in mortality rates between WBAT and non-WBAT groups at 1 year (7.7%; 24.0%;  $P=0.21$ ), 5 years (23.0%; 47.0%;  $P=0.22$ ), and 10 years (66.7%; 64.3%;  $P=0.91$ ).

**Conclusion:** While our findings indicate no significant difference in mortality rates between non-operatively and operatively managed Vancouver B1 periprosthetic fractures, the limited sample size restricts the power of this study to conclusively determine the effectiveness of non-operative management. Larger, more comprehensive studies are needed to support these findings and identify specific criteria for selecting appropriate candidates for non-operative treatment.

## **Do Organisms for Periprosthetic Joint Infections Vary Between Southern, Central and Northern Australia.**

**Flinders Medical Centre, Adelaide, Royal Darwin Hospital, Darwin, Alice Springs Hospital, Alice Springs**

**REGO M, Robertson T, Mukhopadhy S, Hennessy B, Knight C, Doornberg J, Abrahams J, Jaarsma R, Johnson L.**

### **Introduction**

The incidence of prosthetic joint infections (PJIs) is increasing and is representing a greater percentage of revision joint arthroplasty. The organism and chronicity of infection are important predictors of being able to eradicate infection. Literature has shown that microbiological variation exists between different institutions and different climates. In this study, we report on the pattern of microbiology responsible for PJI in three regions across a longitudinal strip of Australia from Darwin to Adelaide, encompassing three centres with vastly different climates across a 3000 km stretch of land.

### **Methods**

Data was retrospectively collected over a 10-year period for presentations between 2009 and 2018 from three tertiary orthopaedic units situated in Adelaide, South Australia, Alice Springs, Northern Territory and Darwin, Northern Territory. Inclusion criteria were any prosthetic joint infection (hip, knee, shoulder, elbow) defined by the 2018 Philadelphia Consensus Criteria that presented to each institution over the study period.

### **Results/Conclusion:**

PJIs are influenced by various factors, including microbiological profiles, environmental conditions, and antimicrobial resistance. This study identified regional variation in the microbiology of organisms involved in PJI diagnosed in Adelaide, Alice Springs & Darwin. Surgeons and clinicians should work to identify evolving patterns of PJI within local regions and adjust prophylaxis and treatment strategies as required.

## Resistance to abrasive force: a biomechanical comparison of four suture materials commonly used in orthopaedic surgery

HUGO WALKER; Parham Foroutan; Ryan David Quarrington; Mr Michael Sandow, Mr Peter Smitham

Health and Medical Sciences, University of Adelaide, Adelaide Health and Medical Sciences Building, Department of Orthopaedics and Trauma, Royal Adelaide Hospital

### Background

Various orthopaedic procedures, namely scapholunate reconstruction, involve the use of suture to assist with fixation. However, their contact point with bone or suture anchors creates a high friction environment and the potential for abrasive failure as a result following cyclical movement. This study aimed to assess if conventional suture or tape material offered greater abrasive resistance, ultimately aiming to provide orthopaedic surgeons with an answer to which material may provide superior post-operative outcomes.

### Methods

Four different suture materials were assessed for abrasive resistance (*Vicryl Ethicon*, *Dynacord Depuy Synthes*, *PolyesterTape Covidien*, *SutureTape Arthrex*). A shoulder implant was used as the standardised abrasive contact point with the materials cyclically pulled by a Dynacell Instron machine proximally and loaded distally by a 2.5kg plate. A displacement of 1cm was used with a frequency of 0.5Hz during cyclical testing. This low frequency was implemented to mirror the early rehabilitation phase. 6 trials were undertaken of each material with exact cycle failure noted by one author (HW).

### Results

SutureTape performed the best out of the four tested materials with mean cycle to failure of 5,246 ( $\pm 1051.01$ ). Dynacord showed relative superiority when compared to its counterpart in vicryl, with a mean cycle to failure of 2,911 ( $\pm 558.21$ ) compared to Vicryl at 21.3 ( $\pm 4.50$ ). The performance of the PolyesterTape was underwhelming, with a mean of 87.5 ( $\pm 29.96$ ) cycles to failure.

### Conclusion

Materials with an ultra-high molecular weight polyethylene (UHMWPE) component (either a jacket or a core), namely SutureTape and Dynacord, outperformed their counterparts, highlighting the protection against abrasion that UHMWPE offers. Additionally, materials with a larger number of filaments within their cross section had greater abrasive resistance (SutureTape and Dynacord). Further microscopy is required to validate this conclusion.

## Slipped Capital Femoral Epiphysis in Indigenous Australian Population

Alice Springs Hospital, Royal Darwin Hospital

JONGHOO SUNG, Rajendra Shetty, Tim Cheek, Jaideep Rawat, Kanishka Williams

**Introduction:** Slipped Capital Femoral Epiphysis (SCFE) is a prevalent hip disorder in pre-adolescent and adolescent children, with significant risk factors including male gender and obesity. Untreated SCFE can lead to severe complications, necessitating vigilant monitoring, especially for unilateral cases at risk of a contralateral slip. This study examines the epidemiology, risk factors, and outcomes of SCFE in Australian Indigenous populations.

**Methods:** This multi-center retrospective study included 85 Australian Indigenous patients with SCFE from two Northern Territory hospitals between 2010 and 2024. Data such as age, posterior slope angle (PSA), and slip characteristics were collected. Risk factors for contralateral slip were identified via penalised logistic regression, and the number needed to treat (NNT) was calculated for prophylactic fixation.

**Results:** The median age at diagnosis was 12.07 years, with a high incidence of valgus slips (10.6%). Seventy-three patients (85.88%) did not have prophylactic contralateral hip pinning of which thirteen patients (17.80%) developed a contralateral slip, with younger age and elevated PSA as significant risk factors. Patients under 12 years with a PSA greater than 9° had an NNT of two for prophylactic fixation, suggesting targeted benefit. Prophylactic fixation showed no subsequent slip or fixation-related complications in our patient population.

**Conclusion:** SCFE in Australian Indigenous patients presents unique challenges, with a higher proportion of valgus slips than reported in other populations. Prophylactic fixation may be beneficial in younger, high-risk patients. These findings underscore the importance of individualized care and a multidisciplinary approach, particularly in remote communities where healthcare access is limited. Tailored interventions for at-risk individuals may improve outcomes and address healthcare disparities in this vulnerable cohort.



## **Prevalence and Severity of Sacral Dymorphism and Implications for Safe Transsacral Screw Placement in the Indigenous and Non-Indigenous Australian Population**

**Alice Springs Hospital, Northern Territory, Flinders Medical Centre, South Australia, Flinders University, South Australia, Royal Adelaide Hospital, South Australia, Adelaide University, South Australia**

**JAMES VIRGIN; Claudia Paul, Tim Cheok, Kanishka Williams, Mark Rickman, Lucian Bogdan Solomon, Boopalan Ramasamy**

### **Introduction:**

The sacrum is essential in providing strength and stability to the pelvis whilst also protecting critical neurovascular structures. As such, complex unstable sacral fractures necessitate surgical stabilisation for which percutaneous iliosacral screw fixation is an established technique. However, anatomic variability of the upper sacral segments (sacral dymorphism) may result in diminished safe osseous pathways complicating surgical fixation. Previous literature has demonstrated varied prevalences of sacral dymorphism amongst different population groups. The aim of this study was to compare prevalence and severity of sacral dymorphism in Indigenous and non-Indigenous Australians to better inform surgical management.

### **Methods:**

Retrospective matched cohort study at single trauma centre (Alice Springs Hospital). Consecutive Indigenous and non-Indigenous Australian patients who received a CT scan of the pelvis between January and March 2024 were included. Patients were excluded if they were under the age of 18 at the time of the scan or had a history of pelvic fractures or fixation. CT scans were assessed for both quantitative and qualitative features of sacral dymorphism as previously described in the literature (1).

### **Results:**

120 patients were included in the study; 60 Indigenous and 60 non-Indigenous Australians. All patients exhibited at least one of the six qualitative features of sacral dymorphism. Indigenous patients demonstrated significantly lower S1 coronal transsacral corridor diameter and S1/S2 transsacral pelvic width. Indigenous patients also demonstrated a trend towards reduced S2 coronal and axial transsacral corridor diameters. In patients where a safe S1 transsacral osseous corridor was not present, the S2 transsacral osseous corridor was significantly wider.

### **Conclusion:**

At least one qualitative feature of sacral dymorphism was present in all study patients. Whilst there was no significant difference in the prevalence of sacral dymorphism between Indigenous and non-Indigenous Australian populations, the results of this study demonstrate a significantly smaller pelvic width and a trend towards smaller S1 and S2 osseous corridors in the Indigenous Australian group. In managing Indigenous Australian patients with transsacral screw fixation, surgeons should be aware and accommodating of these intricacies to achieve optimal patient outcomes.

1. Kaiser SP, Gardner MJ, Liu J, Routt ML, Jr., Morshed S. Anatomic Determinants of Sacral Dymorphism and Implications for Safe Iliosacral Screw Placement. *J Bone Joint Surg Am.* 2014;96(14):e120.

# Outcomes after ankle fractures in patients on haemodialysis for end-stage renal disease: a descriptive study

MIRUTHULAN THAYAPARAN

## Introduction:

Patients with end-stage renal disease who receive haemodialysis commonly have impaired healing capacity. For these reasons, outcomes after treatment of ankle fractures can be expected to be poorer in patients receiving haemodialysis. The NT has the highest dialysis rate of any state or territory in Australia. This study aimed to describe outcomes after both operative and non-operative treatment of ankle fractures in patients receiving haemodialysis.

## Methods:

This study was a single-centred, retrospective study of consecutive patients receiving haemodialysis for end-stage renal disease who were treated for ankle fractures at the Alice Springs Hospital from November 2009 - November 2024. Variables and outcomes recorded included patient demographics, fracture type, complication rate, length of stay and need for unplanned subsequent operation.

## Results:

The rate of overall orthopaedic complications was considerably higher than the standard population (52% vs 6%) and even recorded cohorts of patients with chronic kidney disease (35%). Mortality was observed from non-operative management. Length of stay was markedly higher in patients on haemodialysis than the standard population (36 vs 4.4 days) and not affected by need for operative treatment.

## Conclusions:

Ankle fractures confer serious morbidity and increased mortality to haemodialysis patients. Devastating complications can occur after non-operative treatment. Ankle fractures in haemodialysis patients are likely to confer large costs to the healthcare system.

## **Patient and infection-related predictors of treatment failure after two-staged total hip replacement revision for prosthetic joint infection: a retrospective cohort study**

**DR AMEYA BHANUSHALI, Jaiden Nairne-Nagy, Dr Stuart Callary, Prof. Gerald Atkins, Dr Boopalan Ramasamy, Prof. Lucian Bogdan Solomon**

### **Introduction:**

Treatment of prosthetic joint infections of total hip replacements has high failure rates even after two-stage revision. Identifying modifiable risk factors may allow preoperative optimisation, while identifying non-modifiable risk factors can influence surgical decision-making. Therefore, this study aimed to examine the effect of patient characteristics on treatment failure after two-stage revision total hip replacement.

### **Methods**

This study was a retrospective study of 113 consecutive patients from a single centre that were planned for a two-stage revision total hip replacement between October 2010 and August 2021. Variables examined were related to basic patient characteristics and comorbidities and socioeconomic status. Outcomes recorded included treatment failure, as defined by the Delphi Consensus Criteria, and failure to undergo reimplantation at two years post second stage.

### **Results and Conclusions**

In total, 27 patients failed to undergo reimplantation. Increasing age, American Society of Anaesthesiologists (ASA) score, Charlson Comorbidity Index (CCI), McPhersons Classification host and local extremity grade, peripheral vascular disease and malignancy were all associated with failure to reimplant. Furthermore, 23 out of 113 patients were defined as treatment failures. There was no association between any variables and treatment failure after two-stage revision total hip replacement. Risk factors identified previously in existing literature including, age, gender and CCI did not correlate with treatment failure risk in our cohort. Our study may contribute to future pooled analysis to investigate insignificant trends seen in ASA score, chronic kidney disease, inflammatory arthropathy and ischaemic heart disease."

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