

## 2015/2016 Summer Studentship Project Application Form

Send to: Research Office, University of Otago Christchurch, PO Box 4345, Christchurch, by 5pm on **3 July 2015**

### Supervisor Information (First named supervisor will be the contact):

Supervisor's Name and Title(s): **Dr Deborah Snell**, [wider project team = Ms Anne Sinnott, Dr Jen Dunn, Professor Alastair Rothwell, Dr Jean Hsieh, Professor Gerben DeJong, Professor Gary Hooper.]

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### Research Category (Choose one category only – to be used for judging the students' presentations):

**Clinical X**

**Laboratory**

**Community**

### Project Title (20 words MAXIMUM):

Outcomes after total joint replacement and the role of rehabilitation.

### Project Description:

#### Background to student project and significance:

##### 1. Total Joint replacement is common and increasing:

Total joint replacement (TJR) is the most common and cost-effective elective surgical intervention for end stage degenerative joint disease such as osteoarthritis (OA) (2, 3). In New Zealand approximately 14,000 primary hip and knee TJR procedures are registered by the NZ Joint Registry (NZJR) each year and these numbers are steadily increasing (1). TJR demands are likely to continue to increase as the population ages given the increasing prevalence of age related joint disease (4, 5).

##### 2. Outcomes are generally favorable but a minority benefit less from the intervention:

The long term outcomes following primary TJR for arthritis are generally favourable with most patients experiencing positive functional outcomes (5, 8). Prospective observational studies of expected recovery trajectories after TJR suggest the greatest recovery takes place within the first 12 months for knee replacement and within the first 6 months for hip replacement (5). However 15-30% of knee replacement patients and a smaller number of hip replacement patients report little or no improvement usually because of ongoing pain, restricted range of motion and unsatisfactory function (2, 3, 5-8). A number of demographic and clinical factors have been shown to influence these outcomes, including age, gender, ethnicity, general health and comorbidities, pain, weight (BMI > 35), post-operative complications, surgical wait time, and access to rehabilitation (4, 5). However further investigation is required to understand how these factors impact outcomes and which components are important.

##### 3. Rehabilitation may add value but access to interventions may be unequal:

In New Zealand little is known about the extent to which hip and knee replacement patients with OA actually receive pre- and/or post-surgery rehabilitation care, whether at home, outpatient, inpatient, or at all. Access to rehabilitation may vary by geographic region and patients living in rural areas may have access to different or fewer rehabilitation opportunities. In addition, there may be differences in access to rehabilitation and TJR outcomes based on ethnicity with research highlighting poorer outcomes for Māori across a range of health conditions (9-11).

##### 4. Present programme of research and student project:

We have a wide programme of research examining outcomes after TJR across a range of indicators (e.g., radiological outcomes, patient reported outcomes such as reduction in pain, improved function and quality of life). Positioned within this we have a prospective study underway funded by CMRF specifically examining the impact of rehabilitation on hip and knee replacement outcomes for New Zealanders who live with OA. We are examining the impact of rehabilitation on the basis of access to and type of interventions provided and on factors such as rurality and ethnicity. We have recruited n = 200 participants to date and anticipate having 75% of our target sample by the time the student is engaged. We will provide an opportunity for the student to assist with early data management and analyses to enable the team to monitor recruitment progress/ success. To assist us with interpretation of the data we also wish to engage the student to conduct a scoping review of the available relevant literature. A scoping review attempts to map the research terrain and characterise the breadth and depth of a topic. Levac notes that scoping studies are particularly relevant for new and emerging research topics, where existing literature is limited and of variable quality, and where randomised controlled trials are difficult or rare (12). Arksey and O'Malley state that scoping studies serve several purposes (13 p.21):

1. To examine the extent, range and nature of research activity using available study quality evaluation criteria
2. To determine the value of undertaking a full systematic review
3. To summarise and disseminate research findings and identify research gaps in the literature.

**Aims:**

1. To assist the study team with preliminary analyses of de-identified data collected as part of the prospective study already funded and in progress. This will assist the team evaluate progress toward stratification of variables in the final sample.
2. To conduct a scoping review of available research examining the effectiveness of rehabilitation following hip and knee joint replacement and to conduct a critical review of the scientific quality of studies included in the review.
3. To contribute to completion of a manuscript for publication and development of a clinical trial protocol building on the findings of the review (aim 1) and preliminary data analyses from the prospective study already underway (aim 2).

**Method:**

Aim 1: Preliminary data management and analyses. This will include management of a large database (data cleaning), and assisting with preliminary analyses of demographic variables using a statistical package (e.g., SPSS), to ensure the final sample is representative of the NZ population and adequately reflects variables of interest.

Aims 2 & 3: The review will employ the methodology recommended by Arksey and O'Mally (13) which entails the following stages:

Stage 1: identify the research question

Stage 2: identify relevant studies (and web resources)

Stage 3: study selection

Stage 4: chart the data and critically evaluate the scientific quality of included studies

Stage 5: collate, summarise and report the results.

Electronic literature search from 1990 - present for English language research publications from the following databases: MEDLINE, PsycInfo, EMBASE, CINAHL, Web of Knowledge and Cochrane Collaboration.

**Goals for Project/ Student:**

The student will complete the review as a one off project and should be able to complete this and write up methods and results within the 10 week period. This opportunity will enable the student to i) work within a research team, ii) learn about manage of data and preliminary statistical analyses, iii) develop and refine skills related to conducting scoping reviews of relevant research literature (development of a research question and search criteria, database searching, selection of studies for inclusion in a review, evaluation of scientific quality, collation and presentation of review results), iv) contribute to early development of a follow on clinical trial protocol and funding applications.

**References**

1. New Zealand Orthopaedic Association (NZOA). New Zealand Joint Registry: Fourteen Year Report (January 1999 to December 2012). [www.nzoa.org.nz](http://www.nzoa.org.nz) date accessed 14 January 2014.: 2013.
2. Collins N, Roos E. Patient reported outcomes for total hip and knee arthroplasty. *Clinics in Geriatric Medicine*. 2012;28:367-94.
3. Jeffrey A, Wylde V, Blom A, Horword J. "Its there and Im stuck with it": Patients experiences of chronic pain following total knee replacement. *Arthritis Care and Research*. 2011;63(2):286-92.
4. Bischoff-Ferrari H, Lingard E, Losina E, Baron J, Roos E, Phillips C, et al. Psychosocial and geriatric correlates of functional status after total hip replacement. *Arthritis and Rheumatism - Arthritis Care and Research*. 2004;51(5):829-35.
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6. Turner A, Barlow J, Buszewicz M, Atkinson A, Raitz G. Beliefs about the causes of osteoarthritis among primary care patients. *Arthritis and Rheumatism - Arthritis Care and Research*. 2007;57(2):267-71.
7. Lau R, Ghandi R, Mahomed S, Mahomed N. Patient satisfaction after total knee and hip arthroplasty. *Clinics in Geriatric Medicine*. 2012;28:349-65.
8. Lavernia C, Alcerro J, Brooks L, Rossi M. Mental health and outcomes in primary total joint arthroplasty. *Journal of Arthroplasty*. 2012;27(7):1276-82.
9. Harwood M. Rehabilitation and indigenous peoples: the Maori experience. *Disability and Rehabilitation*. 2010;32(12):972-7.
10. Harwood M. Understanding and improving stroke recovery for Maori and their whanau. Dunedin, New Zealand: University of Otago; 2012.
11. McPherson K, Harwood M, McNaughton H. Ethnicity, equity, and quality: Lessons from New Zealand. *British Medical Journal*. 2003;327:443-4.
12. Levac D, Colquhoun H, O'Brien KK. Scoping studies: advancing the methodology. *Implement Sci*. 2010;5:69.
13. Arksey H, O'Malley L. Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*. 2005;8(1):19-32.

**Student Prerequisites (eg. Medical Student) if applicable:**

We have no special pre-requisites. An interest in the area would help.