ACT Government | ACT Health

ACT HEALTH VACATION STUDY PROGRAM

PROJECT SUMMARY FORM

Project Title	Modelling Muscles for the Identification of Whiplash-Associated Disorder
Supervisor name	Joe Lynch
CHS/ACTHD position	Clinical Research Lead
Address	Trauma and Orthopaedic Research Unit
Telephone	+61 402 498 232
Email	Joe.lynch@act.gov.au

Lead discipline (please select one)

☐ **Nursing and Midwifery**   ☐ **Health Economics**

☐ **Allied Health**   ☐ **Biostatistics**

X **Medicine**

☐ **Pre-clinical**   ☐ **Epidemiology**

                                                       ☐ **Health Policy**

☐ **Other**

Does this project involve research led by, or relating to Aboriginal or Torres Strait Islanders?

☐ Yes	**X** No

Outline of the project (250 words max)

Injuries to the neck following whiplash trauma (whiplash injury) are one of the most common causes of neck pain and disability in the developed world. We are currently conducting a study which uses shape modelling of structures from magnetic resonance (MR) images, in combination with physical and psychological measures, to identify structural lesions of the neck following whiplash injury. The ability to identify and differentiate the relationship between structural lesions and physical and psychosocial measures in whiplash patients will potentially enable more specific and timely management.

The muscles of the neck have been implicated in whiplash associated pain and disability. We have completed muscle segmentation and created 3D models of individual muscles in participants with acute and chronic whiplash and also controls. We are seeking a vacation scholar to undertake statistical shape modelling (SSM) of the 3D muscle models for the systematic comparison of morphometric features between the whiplash and control cohorts.

The primary aim of this project is to examine the utility of SSM for comparing the cervical spine muscles between WAD cohorts and control; and WAD severity cohorts. The secondary aim is to determine whether shape is associated with patient demographics.

Proposed research methods

1. Construct digital 3D muscle models from the segmented magnetic resonance images
2. Perform principal component (PC) analysis to investigate and compare the variations within geometries of the muscles
3. Undertake statistical analyses using multivariate linear models

Preferred study discipline being undertaken by the student

Medicine, physiotherapy or medical radiation science (medical imaging)

Benefits to the student and to the department

The student will gain skills in cervical spine radiological anatomy particularly suited to those with an interest in radiology. The candidates will also gain knowledge in musculoskeletal disorders and skills in data analysis and writing for publication.

How does this project align with any or all of the three strategic objectives of *Better Together: A strategic plan for research in the ACT health system* (100w max)

Better together - A strategic plan for research in the ACT health system 2022–2030

The project aligns with:
Objective 2 ACT people have capacity to undertake high value research in the health system
Objective 3 ACT research infrastructure supports high value research

ACTHD/CHS Department where the student will be based

Trauma and Orthopaedic Research Unit

Will the student be in a patient facing role at any time during the project?

No

Will the student require access to CHS and/or ACTHD network / DHR / applications / database? If yes, please identify

No

Will the student require CHS / ACT Health building access? If yes, please identify

Yes - Trauma and Orthopaedic Research Unit

Supervisor availability across key dates

Friday 10 Nov – Preplacement presentation session,	Yes

Canberra Hospital Auditorium *Approximate duration 9am-12pm – supervisors are not required for full session. Possible Webex option.*	
Placement period 10 Nov – 9 Feb Please indicate availability across this time. *E.g. leave over Christmas/New Year*	*Yes*
At least two face-to-face sessions with the student each week during their 6-week placement.	Yes
Friday 9 Feb – Final presentation session, Canberra Hospital Auditorium *Approximate duration 9am-1pm – supervisors are not required for full session. Possible Webex option.*	Yes

X I have read and I agree to the ACT Health privacy policy which includes statements on how the ACT Health Directorate acts lawfully to collect and use data to report on activities and to plan for future events and initiatives; including that we may use your details to contact you if required for program delivery and/or evaluation and to inform you of future similar opportunities.

Please submit form to health.research@act.gov.au