BSc in Reproductive & Developmental Sciences &

BSc in Surgery and Anaesthesia Project Outline 2011-2012

**Project Title: Hip movement in femeroacetabular impingement using a motion capture system**

**Academic Supervisor: Alison McGregor**

**Division: Surgery and Cancer**

**Section: Orthopaedics**

**Co-supervisor: Adeel aqil, Milad Masjedi**

**Who will be responsible for day-to-day supervision? Adeel aqil**

**Contact Details of Person whom Medical Student should contact for further details:**

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**Group’s Research Interest: hip and knee disease**

(Double click the appropriate check box to indicate your choices below)

**Is this a clinical or laboratory  project?**

**Suitable project for: Reproductive and Development**  **Sciences** Yes No

**Surgery and Anaesthesia** Yes No

**Synopsis of project (background/research question/methods to be used/relevant key references):**

**Background to Project:**

Subjects with pathological hips such as those with femoroacetabular impingement (FAI) may illustrate poor function and reduced range of motion (RoM).

In order to evaluate patients post correction surgery, it will be necessary to assess the gait pattern and range of motion of normal subjects. The student will also use 2D readings obtained with the use of hand held goniometers as well as clinical tests (such as impingement tests) commonly used for the diagnosis and assessment of the severity FAI. This will be followed by comparing the accuracy of conventional clinical and 2D motion assessment with those of the 3-D vicon motion capturing system (by attaching the reflective markers on the bony landmarks and recording their position during movement).

The ultimate value of this information would be in being able to compare how different surgical techniques potentially improve the abnormal walking patterns so that they resembled that of a ‘normal population’ without hip disease.

**Hypothesis Student will investigate:**

1. Motion assessment using a 2-D goniometer although quicker will be less accurate when compared to the 3-D vicon capturing system. Both systems are equally susceptible to patients of differing body mass index (BMI).
2. The RoM at the hip joint for subjects without pathology will be greater and have less variation than that of a population with pathological joint disease. (Focusing mostly on patients with FAI).

**Methods/Techniques Student will use:**

## 40 subjects will be selected from a normal population (20 male and 20 female) with ages ranging between 18 and 40, who are not known to have hip pathology. The student will need to design a new protocol to attach markers and activities to evaluate the active and passive RoM, using the motion capturing system (vicon). Apart from walking, activities that require a larger motion at the hip joint such as rowing and squatting will also be assessed in a similar manner.

Will the research involve work done under the Animals (Scientific Procedures) 1986 Act? Yes No

**Key Reference:**

Moreside JM, McGill SM. Quantifying normal 3D hip ROM in healthy young adult males with clinical and laboratory tools: hip mobility restrictions appear to be plane-specific. Clin Biomech (Bristol, Avon). 2011 Oct;26(8):824-9.

**If YES*,***

Will the student be required to undergo Home Office training? Yes No

Are the appropriate project and personal licences in place? Yes No

**Project licence**:

Licensee

Date of issue

Number

**Personal licence**:

Licensee

Number

**Will the research involve the use of genetically modified tissue?** Yes No

**If YES**

Has the work been approved by the relevant GM Committee Yes No

Date approval was granted

Reference Number

**Will the project involve work on human subjects, human tissue or access to confidential patient information?** Yes No

## If YES

## has ethical approval been obtained Yes No

## Date approval was granted

## IC REC or IRAS REC number

**Note: Approval for any of the above MUST be in place before the student begins the project.**

**A risk assessment form will be required.**

**Project Payment**: I have an F account Yes No

## If you have an F account please give full account code: