

Title: Clinical phenotypes and predictors of progression of knee Osteoarthritis
PhD project (Available to self-funded Home & EU / international students)
Supervisors: Weiya Zhang and Michael Doherty, Division of Academic Rheumatology
Theme: Rheumatology
Keywords: Osteoarthritis, subgroups, predictors and cohort study
Fee band: Home EU: £3825; International - £11,990

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Background: Osteoarthritis (OA) affects a substantial proportion of people aged over 40 years. Knee is the most common large joint affected by OA and the burden of the disease will likely rise due to ageing and increased prevalence of obesity^{1;2}. More than 50 treatments are currently available for OA³. However these therapies are limited by efficacy, tolerability and adherence issues and consequently many people with OA continue to have pain and poor quality of life. Individualised therapy based on patient risk factor profile, clinical presentation and predictors of progression is therefore required.

Objectives: The objectives of this PhD project include:

1. To identify clinical phenotypes (ie, subsets) in people with knee OA;
2. To compare progressions between phenotypes; and
3. To identify predictors of progression.

Methods: A cohort study will be undertaken in 2000 people with knee pain and/or knee OA obtained from the Osteoarthritis Initiative (OAI) population cohort. The OAI consists of 5000 community men and women aged from 45 to 79 years. The cohort includes 2000 people with knee pain/OA and 3000 at high/low risk of knee pain/OA. It has been followed up for 4 years for clinical data (knee pain, disability, pain elsewhere), imaging (x-rays and MRI), laboratory (blood and urine), risk factors and co-morbidities. People with knee pain and/or knee OA (n=2000) will be eligible for this study. They will be classified into different sub groups (phenotypes) according to clinical presentation, imaging (X-rays and MRI), risk factors and comorbidities and followed up for the outcomes of interests. Clinical outcomes will be compared between phenotypes. Predictors of progression (including medication in the past 4 years) will be identified and their effects on each of the phenotypes will be examined.

Training/supervision: A standard PhD training package will be provided including literature review, study design, data collection, validation, analysis and writing up thesis. Additional training will be added according to individual needs. The successful applicant will be jointly supervised by Dr Weiya Zhang (Reader in Musculoskeletal Epidemiology) and Professor Michael Doherty (Professor of Rheumatology, and will work in the team including clinicians, nurses, academics and other PhD students.

For further information or informal enquiries please email with CV to:
Helen.richardson@nottingham.ac.uk

Reference List

1. Muthuri SG, Hui M, Doherty M, Zhang W. What if we prevent obesity? Risk reduction in knee osteoarthritis estimated through a meta-analysis of observational studies. *Arthritis Care Res* 2011;**63**:982-90.

2. Zhang W, McWilliams DF, Ingham SL, Doherty SA, Muthuri S, Muir KR *et al.* Nottingham knee osteoarthritis risk prediction models. *Ann Rheum.Dis.* 2011;**70**:1599-604.
3. Zhang W, Nuki G, Moskowitz RW, Abramson S, Altman RD, Arden NK *et al.* OARSI recommendations for the management of hip and knee osteoarthritis: part III: Changes in evidence following systematic cumulative update of research published through January 2009. *Osteoarthritis Cartilage* 2010;**18**:476-99.