



## TRAM (Train and Retain Academic Musculoskeletal clinicians) MB-PhD Project Summary

### PhD project Title

Psoriatic Arthritis, comorbidity and treatment burden: Personalised risk stratification based on risk of adverse clinical outcomes.

### PhD supervisors (please provide name, affiliation and email) [At least two supervisors]

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### Background

It has been recognised that patients with psoriatic arthritis experience an increased risk of other long term conditions including hypertension, metabolic syndrome, and diabetes(1) as well as multimorbidity (defined as presence of two or more long term conditions)(2). The implications of having psoriatic arthritis alongside other long term conditions or multimorbidity for patients and their use of health services is not well understood. Few studies have reported on the prevalence of other long term conditions or patterns of multimorbidity for people with psoriatic arthritis or their impact on management of this condition or outcomes. Treatment burden refers to the patients' workload in managing their long term conditions and associated healthcare demands, and the impact this has on well-being (3). It is unclear how treatment burden affects the disease course and risk of adverse outcomes in patients with psoriatic arthritis or how this is impacted by the presence of other long term conditions or multimorbidity. Understanding the impact of these will help inform strategies to address the key issues and improve outcomes for people with psoriatic arthritis.

### Aims

The project will involve application of data science approaches to understand the impact of multiple longterm conditions in patients with psoriatic arthritis and inform risk stratification based on their demographic, lifestyle factors, treatment burden profile, morbidity measures, and routine clinical blood tests. The project will use several distinct cohorts: UK Biobank (UKB), the Scottish Psoriatic arthritis Observational Study (SOPHOS) and the Clinical Practice Research Database (CPRD) or other cohorts that the team have access to via the HIPPOCRATES programme (<https://www.hippocrates-imi.eu/>). The SOPHOS data has the PETS (pt experience with treatment and self-management) and PSS (perceived stress scale) questionnaires available for their participants. UK Biobank is a community research cohort of half a million people with extensive phenotypic information collected at recruitment and data



linkage with clinical records to study clinical outcomes. SOPHOS is a national prospective longitudinal cohort study of new or recent onset psoriatic arthritis with information available on comorbidities, biomarkers, clinical outcomes and treatment burden measures. CPRD is one of the largest primary care routinely collected data and representative of UK general population. In addition, there will be opportunities to explore the use of other datasets via the IMI HIPPOCRATES programme, a pan European consortium of Psoriatic Arthritis cohorts (Siebert and Mair are collaborators and work package leads)

#### Research Questions

1. What is the profile of multimorbidity and treatment burden in patients with psoriatic arthritis?
2. How does the presence of additional long-term conditions and treatment burden influence disease-specific clinical outcomes in patients with psoriatic arthritis?
3. How do demographic, lifestyle factors, morbidity measures, and routine clinical blood tests mediate the relationship between individuals with psoriatic arthritis and adverse health-related outcomes (e.g., death, hospitalization, cardiac events)?
4. Can individuals with psoriatic arthritis and other long term conditions at high risk of adverse outcome be identified to inform a more stratified or targeted approach?

#### **Training and experience provided** *[Include types of methodologies that will be employed]*

This PhD project will be undertaken under the guidance of an experienced and multidisciplinary supervisory team with relevant clinical and data science expertise. The student will have training and experience in different research methodologies such as literature review and appraisal, population health, cohort analysis and data science approaches using a variety of relevant datasets. The student will receive specific training and develop competencies in epidemiology and statistical analysis using complex and innovative methods that can be widely applied to healthcare research. The project will also enable the student to develop generic research and communication skills, and provide enduring clinical academic mentorship to leave the student well placed for a future career in clinical academia.

#### **Expected outcomes**

The main aim of this study is to use routinely collected data and prospective psoriatic arthritis research cohorts to understand the implications of additional long-term conditions and measure the treatment burden experienced. The study will also find out how multimorbidity and treatment burden are associated with disease-specific and adverse clinical outcomes for people with psoriatic arthritis.

This work has the potential to identify those patients with psoriatic arthritis who are at higher risk of poor health due to the presence of additional long term conditions and increased treatment burden. It will help inform policy and treatment decisions in order to improve care for patients with psoriatic arthritis.

#### **References**

1. Gupta S et al. Comorbidities in psoriatic arthritis: a systematic review and meta-analysis. Vol. 41, Rheumatology International. 2021.
2. Harrison C et al. Comorbidity versus multimorbidity: Why it matters. J Multimorbidity Comorbidity. 2021;11.
3. Gallacher K, et al. Uncovering treatment burden as a key concept for stroke



care: a systematic review of qualitative research. PLoS Med [Internet]. 2013;10(6):e1001473.