

Cardiometabolic Disease Theme

Theme Leads - David Beech and Eylem Levelt
University of Leeds and Leeds Teaching Hospitals Trust



Worldwide, CVD causes ~32% of deaths (<70 years old)

Cardiovascular mortality is worse in the North of England

~1 million people have heart failure in the UK

Insulin resistance is an independent risk factor for developing heart failure

Our focus Heart failure in people with diabetes

Theme Executive

Professor David Beech (Chair)	Science
Professor Eylem Levelt (Deputy Chair)	Cardiology
Professor Sven Plein (BHF)	Cardiology
Professor Robert Ariens	Science
Professor Mark Kearney (BHF)	Cardiology
Dr Richard Cubbon (BHF PhD Programme)	Cardiology
Professor Khalid Naseem (LICAMM leadership)	Science
Professor Ramzi Ajjan	Diabetology
Dr John Gierula (NIHR Fellow)	Cardiac physiology
Professor Jurgen Schneider	Medical physics
Professor Helen Philippou	Science
Mrs Joanne Beeton	Administration

Setting-up Year 1

Team assembly

Research Technician

Research Nurse 1 (part CRF)

Research Nurse 2

Clinical Research Fellow

Cardiometabolic Inclusion Lead (CRF)

Aparna Sinha

Caroline Smith

Planning for Year 2

Henry Procter

Julie Corrigan

Aligned members

Clinical Research Fellow

Clinical Research Fellow

BHF Mautner Fellow

BHF 4-Year PhD student

Marilena Giannoudi

Sindhoora Kotha

Fiona Bartoli

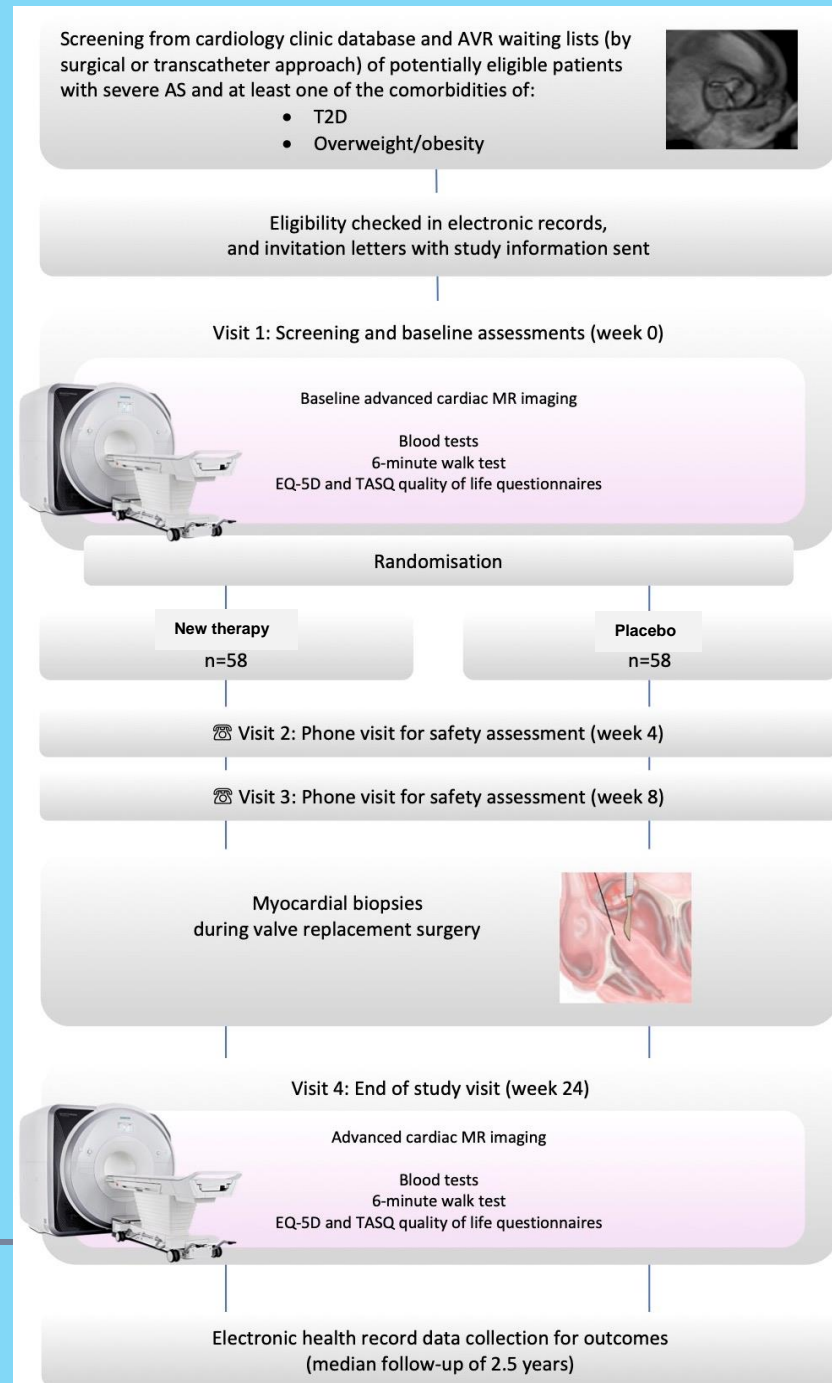
Anna McGrane

Research

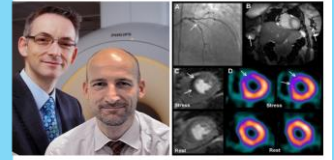
3 integrated work streams aligned to clinical studies

+/- type 2 diabetes mellitus

- Identify most at-risk patients
- Optimize the use of therapies to maximise benefits for patients
- Accelerate progress to innovative new diagnostics and treatments



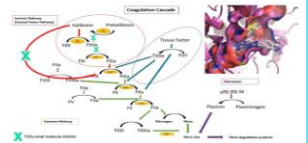
Imaging



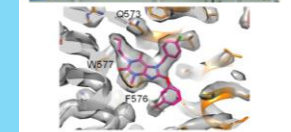
2022 Women as One Escalator Award



Anticoagulation



Ca²⁺ homeostasis



Target patient group

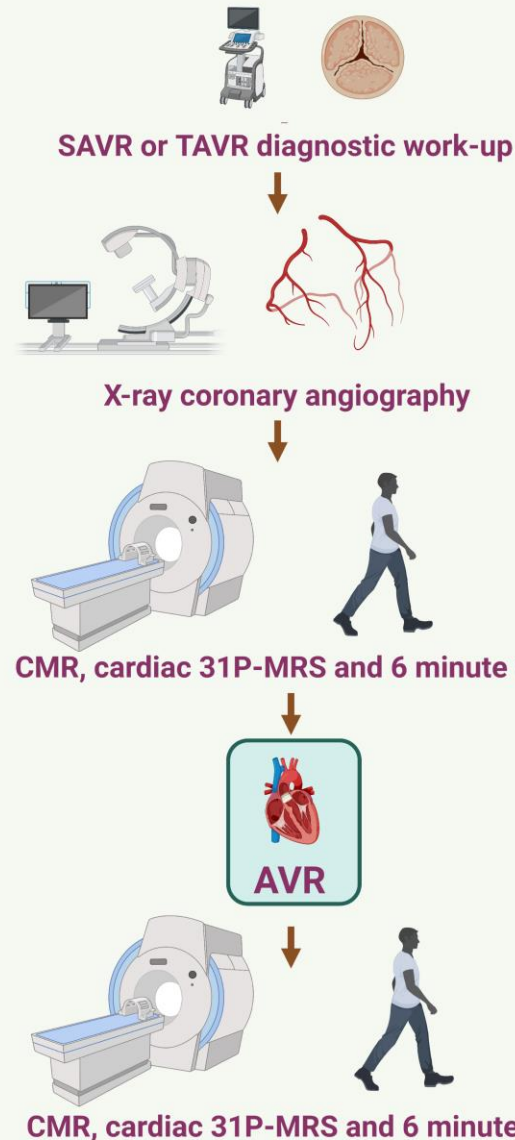
25 Sept. 2023 output

Circulation

ORIGINAL RESEARCH ARTICLE

Association Between Type 2 Diabetes and Changes in Myocardial Structure, Contractile Function, Energetics, and Blood Flow Before and After Aortic Valve Replacement in Patients With Severe Aortic Stenosis

Nicholas Jex, MBBS, MRCP; John P. Greenwood, PhD; Richard M. Cubbon, PhD, MRCP; Oliver J. Rider, DPhil, MRCP; Amrit Chowdhary, MSc, MBChB, MRCP; Sharmaine Thirunavukarasu, MBChB, MRCP; Sindhoora Kotha, MBChB, MRCP; Mariena Giannoudi, MRCP, MBBS; Anna McGrane, MSc; Amanda Maccannell, MSc; Marcella Conning-Rowland, MSc; Sam Straw, MRCP, MBBS; Henry Procter, MBChB; Sotiris Papaspyros, MRCS; Betsy Evans, PhD; Kalyana Javangula; Antonella Ferrara; Walid Elmahdy; Pankaj Kaul, PhD; Hui Xue, PhD; Peter Swoboda, PhD, MRCP; Peter Kellman, PhD; Ladislav Valkovič, PhD; Lee Roberts, PhD; David Beech, PhD; Mark T. Kearney, PhD; Sven Plein, PhD; Marc R. Dweck, MD, PhD; Eylem Levelt, DPhil, MRCP



Patients with severe AS with (n=30) and without T2DM (n=65) without significant coronary artery stenosis undergoing SAVR

Before the AVR in severe AS

Patients with T2DM show worse impairments in myocardial energetics and myocardial blood flow compared to those without T2DM

After AVR

In patients with severe AS without T2DM, significant improvements in myocardial energetics, myocardial blood flow, cardiac function and 6-minute walk distance were observed with AVR

However, in patients with severe AS and T2DM myocardial energetics, myocardial blood flow, cardiac function and exercise tolerance did not improve even after AVR

Leveraging of funds to do the research

Examples so far

- BHF Chair and Programme renewal Kearney £1,895,356 Heart failure and diabetes
- BHF Clinician Award Swoboda £439,965 Cardiac imaging biomarkers
- BHF Intermediate Fellowship Duval £819,875 Anti-coagulation and theme cross-cutting
- CalTIC venture capital Beech €5M Cardiometabolic Ca²⁺ homeostasis
- MRC-BHF Partnership Award Plein CARDIO-IMID £1,519,000 Imaging and cross-cutting

For PPIEP

Alumni donations £5,609 2023-2024

Regional PPIEP

Theme ambassador: John Gierula

Coordinated BRC effort towards under-served groups

Patient and Public Involvement, Engagement and Participation



National Translational Research Collaboration (TRC) NIHR-BHF Cardiovascular Partnership

Steering Group, Pump priming, PPIEP

Aortic stenosis - Eylem Levelt

Maternal health - Eylem Levelt

MI with non-obstructive coronary arteries (MINOCA) - Erica Dall'Armellina

Myocarditis theme synergy with Cardio-IMID - Sven Plein

Research events talks and discussions all welcome

Cardiometabolic Disease Research at Leeds NIHR BRC Theme Kickoff Event - 2 March 2023

87 delegates from the University of Leeds and Leeds Teaching Hospitals NHS Trust

The Met Hotel, Leeds

Funded by Leeds Institute of Cardiovascular and Metabolic Medicine

Talks

- BRC and Theme overview
- Imaging cardiac metabolism
- Polygenic risk scoring
- Personalised pacemaking
- Prenatal and neonatal cardiac MRI
- RNA sequencing for novel targets
- Cardiovascular disease in chronic inflammation
- Transcatheter aortic valve implantation
- Lipid lowering in peripheral arterial disease
- Clot structure and thromboembolism

Discussions

- Team grants, industry projects, developing careers

Cardiometabolic Disease Research at Leeds NIHR BRC Theme Follow-up Event - 12 December 2023

~40 delegates from the University of Leeds and Leeds Teaching Hospitals NHS Trust

Venue: University House, Leeds

Refreshment and lunch

Funded by NIHR BRC Theme

Talks (provisional)

Computer simulations of heart function
Echocardiographic biomarkers
Smart wound imaging
Advanced imaging modalities
Cardiovascular clinical pathology
Muscle and exercise limitations
Exercise training in heart failure
CVD and COPD comorbidity
In silico trials for valve replacements
Platelets in patients
Acquired mutations in CVD
Patient and public involvement

Discussions

New patient-focussed research and team efforts

Mike Coleman
Maria Paton
Anna Tiganescu
Patrick Coughlin
Kathryn Griffin
Scott Bowen
Hannah Campbell
Oliver Price
Oguz Can Eren
Khalid Naseem
Fareeha Tariq
Julie Corrigan

Interested?

Contact Joanne Beeton j.c.beeton@leeds.ac.uk