AMRG is taking MRI imaging to the next level through research, software and clinical trials

AMRG specialises in three areas of MRI-based work:

- **Quality assured core laboratory and clinical research study management**
  AMRG has extensive experience as a core laboratory in the management, performance and analysis of large scale clinical trials involving many centres worldwide.

- **Software analysis services**
  AMRG’s cutting edge cardiac analysis software enables quick and accurate analysis of large numbers of MR images for important and clinically relevant parameters such as cardiac mass, volumes and ejection fraction. Highly specialised analyses are also available.

- **Coordination of international multi-centre pharmaceutical trials**
  AMRG sets up and administers national and international clinical trials for pharmaceutical companies investigating new drug treatments for heart disease and cancer. These trials total in excess of 2000 MRI studies.

MRI is now recognised as an essential tool for investigating cardiac and related medical conditions. Its precision and accuracy for cardiac parameters is increasingly being used by international pharmaceutical companies as a cost effective assessment of the benefits of new treatments. One of the keys to MRI’s usefulness is image analysis software.

**Cardiac Image Modeller (CIM)**
CIM was developed at The University of Auckland by Associate Professor Alistair Young and Associate Professor Brett Cowan to predict and understand the effect of surgical and pharmacological treatment on cardiac function.

CIM generates rapid visualisation and functional analysis, in 3D space and through time, of the hundreds of cardiac MR images typically acquired for each case. It offers significant advantages over other image processing-based approaches in cardiac MR analysis, including faster and more efficient image analysis, real time changes and updates, better image quality than standard techniques, much richer and more detailed data and a 4D display.

Parts of CIM have been licensed to Siemens Medical Systems for worldwide distribution and have been installed in world-leading research institutions including Johns Hopkins University, the National Institutes of Health and UCLA in the USA and to Oxford College in the UK. Siemens, the world’s largest MRI manufacturer, rates AMRG as its number one cardiac MRI research site internationally.
Taking MRI imaging to the next level

Cardiac Atlas Project
AMRG’s expertise has been further recognised with a US National Institutes of Health (NIH) grant to provide an internet accessible structural and functional atlas of the heart. AMRG is working with the Auckland Bioengineering Institute on this project which will ultimately result in a worldwide database of pooled data and images from a number of research studies to create an atlas of regional heart function. CAMRI’s expertise is so highly valued that it leads UCLA and Johns Hopkins input on this project.

The Auckland Cardiac Atlas
The atlas is a complete MRI image set of a normal patient’s heart that allows users to interactively study anatomically labelled images. Movies, or cines, allow investigation of both the complex motion of the heart through its cycle and its blood flow. The atlas aims to provide university and school students, MR technologists, clinicians and patients a tool for learning about the heart’s anatomy while becoming familiar with MRI, an important and growing tool in cardiology.

SAVE – MRI sub study
SAVE (Sleep Apnea Cardiovascular Endpoints study) is an international multi-centre clinical trial to determine the effects of nasal continuous positive airway (CPAP) in preventing cardiovascular disease in high-risk patients with moderate-severe obstructive sleep apnea (OSA). It is being run by the Adelaide Institute for Sleep Health and The George Institute for International Health, both in Australia. AMRG is running the SAVE MRI sub-study in collaboration with these groups, with funding from New Zealand’s Health Research Council. The sub-study aims to evaluate the effect of CPAP on the heart and blood vessels using MRI. This collaboration allows AMRG to combine recruitment networks, MRI scanning, clinical trial infrastructure and academic expertise between Australia, New Zealand and China as part of a strong clinical trials research network.

AMRG co-directors
Clinical Director
Associate Professor Brett Cowan is Director of the Centre for Advanced MRI and an experienced medical practitioner who also has a first-class honours degree in Mechanical Engineering. This allows him to provide the interface between technical and software requirements and ensure the successful completion of clinical trials.

Technical director
Associate Professor Alistair Young is Director of the Biomedical Imaging Research Unit at the School of Medical Sciences and the Research Manager for CAMRI. He is also the principal investigator for the Cardiac Atlas Project.

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