

**The ARC Centre of Excellence for Medical Diagnostic & Therapeutic Technologies** will coordinate existing internationally competitive national research strengths to establish a strategic fundamental research platform for expansion of the medical diagnostic technology industry nationally, and for expansion into new markets both locally and internationally. It will embrace a novel 'design-directed' approach to the identification of strategic research initiatives that will maximize the competitiveness of both diagnostic and therapeutic medical devices and systems based on new technology.

The *CoE* will address strategic design targets identified in specifically identified disease states where both diagnoses and non-drug therapeutic options are either nonexistent or suboptimal. A central theme throughout the program is a patient-centric (model) approach to systems design, including:

- *novel approaches to the acquisition and processing of multi-modal medical images, in specific diseases such as brain and breast cancers, and*
- *innovative approaches to design of new sensor technologies and processing methods for local and remote screening of patients, including sleep disordered breathing in childhood and adult populations.*
- *new approaches to the imaging and functional analysis of musculo-skeletal systems while under dynamic loads, in particular, those affecting cartilage and core-stability muscles, and*
- *the development of robust, wireless control and power systems for biventricular assist devices for patients with end-stage cardiac disease.*

The 'patient-centric model' approach provides an effective linkage between fundamental research and engineering applications. Positive outcomes will improve disease diagnosis and assist in the timely delivery of care to regional and remote centres, as well as providing analytical tools that permit sensitive monitoring of pharmaceutical trials.

The initial projects undertaken will provide a proof of concept demonstration of the common underpinning technology utilised in different clinical settings. Coupled with a focus on genuine innovation in device and assisted diagnosis design and advances in downstream processing, it ensures that the *Centre* will fill a critical void in the national diagnostic systems research strategy and provide a vital new link between clinical need, biomedical engineering research and industry sectors.