

# MELBOURNE SCHOOL OF HEALTH SCIENCES

## RESEARCH STRATEGY

The School of Health Sciences consists of five essential health discipline departments: audiology and speech pathology, nursing, optometry and vision sciences, physiotherapy and social work.

In order to ensure that the breadth of our research activity produces the best health outcomes, our research efforts will be prioritised according to the following criteria:

1. **Excellence.** Our research will be conducted at a nationally competitive level
2. **Strategic direction.** Our areas of research focus will deliver a strategic advantage to the University of Melbourne as a leading national and international Centre of Learning and Research Excellence
3. **Translation and relevance.** Our research will be of direct relevance to and informed by the health needs of the community and will be undertaken with the overt intent to enhance practice knowledge for improved health outcomes.
4. **Collaboration.** Our research will involve colleagues across the University, health services, government and non-governmental agencies, patients and the community.
5. **Sustainability.** Our research will be sustainable in the long term and will leverage new sources of research income.

In order to deliver against the aspirations of our research strategy we will:

- Build on our existing strengths
- Strategically invest in research aligned with FMDHS priority investment areas
- Encourage research capacity growth and capitalise on collaboration and funding opportunities as they arise

### Research Themes

The School has clustered the broad array of research activities in its five departments into six themes which cross the boundaries of disciplines and settings. While each theme is distinct, a common characteristic is a focus on disease prevention and the promotion and protection of health and wellbeing. Chronic, non-communicable diseases are a leading cause of disease burden in the Australian and international community, resulting in many people living with illness, pain and restrictions in activity over many years. However a considerable proportion of chronic diseases and conditions are known to be preventable or best treatable if detected early and, as such, addressing their risks and determinants is core to our research programs.

The focus of each of the themes: child health and wellbeing; recovery and rehabilitation across the lifespan; immunology; neuroscience; practice and service improvement; and, cancer is described below with a list of research programs undertaken within and across departments in the School of Health Sciences.

### ***Child Health and Well-being***

Every child's early experiences have a significant impact on their learning, development, health and future prospects. We recognise that the support that children and young people receive early in life is critical for their long-term health and wellbeing, educational, social and economic outcomes as adults.

Our programs of research in child health and wellbeing are extensive and span areas of health and social care. In the area of children's health we undertake world-leading research relating to learning and communication in children with cochlear implants, advances in bilateral and binaural hearing; the assessment of pain in preverbal children; the physiology of the neonate/parent interaction; improving the safety and quality of care of hospitalized children, and advances in child physiotherapy. We are committed to supporting children's care undertaking applied research that addresses some of our most pressing social concerns, for example, understanding the dynamics of child abuse and family violence, and developing and embedding social innovations that make a positive difference in the lives of vulnerable children.

- Alliance to Eradicate Violence toward Women and Children (SW)
- Partnership for Innovation in Out-of-home Care (SW)
- Children (Physio)
- Broader Outcomes, Learning and Communication in Children (ASP)
- Bilateral and Binaural Hearing (ASP)
- Improving the safety and quality of care of hospitalised children (Nursing)
- The role of visual attention in reading development and dyslexia (DOVS)

### ***Recovery and Rehabilitation Across the Lifespan***

Cancer, musculoskeletal disorders, cardiovascular diseases and mental and behavioural disorders are the leading causes of premature death and disability in Australia. Our programs of research focus on these prioritised action areas for the Australian population, and include development and evaluation of interventions for individuals recovering from trauma, major surgery, critical illness and mental health impairments; conservative management strategies for individuals with musculoskeletal

dysfunction and sports injuries and for those with hearing impairments receiving cochlear implants and with speech and language disorders.

- Trauma Recovery and Resilience Research Program (SW)
- Musculoskeletal and Sports Rehabilitation (Physio)
- Acute Cardiorespiratory Rehabilitation (Physio)
- Cochlear Implants in Adults and Children (ASP)
- Identification and Management of Hearing Disorders (ASP)
- Identification and Management of Speech and Language Disorders (ASP)
- Prevention, Identification and Management of Vision Disorders (DOVS)
- Self-management of chronic wounds (Nursing)
- Consumer led recovery to mental health (Nursing)

### ***Immunology and inflammation***

Infectious diseases and immunological disorders remain one of the leading causes of disease. The immune system is key to fighting infection, but also plays a role in unwanted responses such as allergies and excessive chronic inflammation following clearance of pathogens.

Our research is aimed at assessing the biochemical mechanisms that underpin immunological and inflammatory responses in the eye (eg. corneal and retinal) and on the eye's surface (e.g. in conditions of dry eye and contact lens wear). The research is directed to understand the cellular and chemical mechanisms of eye disease, with the translational goal of improved treatments for eye disorders. Additionally, inflammation plays a key role in normal wound healing whereas abnormal inflammatory responses are associated with the most common forms of chronic lower limb ulceration. Our research explores methods of identifying and managing chronic inflammatory changes in leg ulcers and other chronic wounds.

- Ocular Immunology Unit (DOVS)
- Inflammation and wound healing (Nursing)

### ***Neuroscience***

Neuroscience is one of the largest areas of study in modern biology. The field of neuroscience encompasses understanding the fundamental organisation and principles of the nervous system, through complex neural systems and behaviours. Disorders of the brain and other neural tissues represent some of the leading causes of death and disability in Australia, and are a key research theme for the university as evidenced by the establishment of the Melbourne Neuroscience Institute and significant involvement in the Melbourne Brain Centre.

Our neuroscience research is strongly focused on sensory neuroscience (both vision and hearing), speech neuroscience and neurological rehabilitation. Our sensory and speech programs aim to improve understanding of how the brain performs neural computations, whether such processes are altered across the lifespan, as well as studying how normal neural processing is conducted by the peripheral sensory organs (eye and ear). Our neurological rehabilitation programs are directed to improving functional impairments and health related quality of life in individuals with acute and chronic neurological disorders including traumatic brain injury, stroke and Parkinson disease. We conduct a breadth of research directed to enhancing knowledge and future treatment of specific neurological disorders, in particular those affecting the sensory systems.

- Speech Neuroscience Unit (ASP)
- Auditory Neuroscience Unit (ASP)
- Identification and Management of Vestibular Disorders (ASP)
- Neurological rehabilitation (Physio)
- Retinal imaging to enhance understanding of visual neurophysiology in health and disease (DOVS)
- Functional neuroscience of the retina/visual pathway (DOVS)
- Cortical visual neuroscience (DOVS)
- Ocular motor control mechanisms (DOVS)
- Clinical Industry Research (DOVS)
- Neuropsychopharmacology and medication safety (Nursing)

### ***Practice and service improvement***

Quality and safety of health care is paramount to reducing the burden of disease and disability in our community and to the delivery of value based health care. Our programs of research are aimed at improving effectiveness, safety and quality across a range of health and human services and disciplinary practices. Areas of practice and service improvement research include, but are not limited to, the prevention, identification and management of mental illness, hospital acquired and disease specific wounds, clinical aggression, chronic diseases, medication errors and domestic violence; and, enhancing the experiences of individuals and families as they traverse the complex web of primary, secondary and tertiary health and human services.

- Centre for Applied Research in Effective Services (SW)
- Practice Research Program in Health and Mental Health (SW)
- New models of chronic disease management in primary care (Nursing)

- Wound prediction, prevention and management (Nursing)
- Centre for Psychiatric Nursing (Nursing)
- Health service utilisation in Emergency Department (Nursing)
- Reducing restrictive interventions in the management of clinical aggression (Nursing)
- Evidenced based practice in eyecare (DOVS)

### ***Cancer***

Cancer is the second-most common cause of death in Australia. One in two Australian men and one in three Australian women will experience a diagnosis of cancer by their 85<sup>th</sup> year. By 2020 the number of new cases diagnosed annually will reach approximately 150,000 - an increase of almost 40% from 2007. Despite advances in novel anti-cancer therapies, that are revolutionising and how and where we treat people affected by cancer, outcomes from these diseases remain highly variable across disease types, Indigenous status, gender and social status.

Our cancer research programs focus on examining and developing novel methods to respond to modifiable risk factors that impact patient experience and clinical outcomes, including: communication and health literacy, disease and treatment-related problems, psychosocial factors, health service system and process issues, and health promoting opportunities such as the role of exercise rehabilitation and physical activity in cancer care. We do this across several different types of cancers.

- Health promotion - Exercise oncology (Physio)
- The use of big data to assist in recognising and responding to disadvantage and inequity in cancer care (Nurs)
- Geriatric oncology (Nurs/SW)
- Indigenous Health (SW)
- Women and cancer (SW/Nurs)
- Patient centred models of care and health service efficiency (Nurs)
- Disease and treatment-related problems- Pain screening, assessment and management
- Malignant wounds (Nurs)
- Communication across the cancer workforce – enhancing patient experience and staff wellbeing (Nurs)