



The Royal
Melbourne
Hospital

Advancing health for everyone, every day

The Royal Melbourne Hospital
Research Strategy 2020-2025



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Executive Summary

At the Royal Melbourne Hospital, excellence in clinical care is underpinned by an embedded culture of research engagement. We are constantly striving to improve patient care; treatments, therapies and the processes that allow us to make the Royal Melbourne Hospital a great place to receive care and ultimately improve the quality of life of our patients and clients. This research and improvement culture supports academic clinicians to lead advances in health and medical science, and implement clinical practice at the leading edge of these developments.

Research at the Royal Melbourne is supported by engagement with precinct partners including The University of Melbourne, the Walter and Eliza Hall Institute, the Florey Neurosciences Institute and the Doherty Institute which support clinical and translational research through engagement with the scientific capability, research infrastructure and cross-disciplinary capacity of these academic partners.

Clinical research must be responsive to changing community needs. Contemporary issues include a diverse and ageing population that demands a consumer voice in how care is delivered, developments in data acquisition and analytics capacity, technologies and that enable personalised medicine and a growing recognition of the place and relevance of Australia's indigenous community in healthcare advancement for all. A strategic plan must reflect these external realities.

We are proud to present *Advancing health for everyone, every day* our research strategy 2020-2025 named after our organisational purpose and aligned to our broader organisational strategy. The research priorities below will guide our decisions in the next 5 years to progress research programs at the Royal Melbourne Hospital:

1. Foster the development and retention of academic clinicians to drive clinical research and practice innovation
2. Drive translational research through engagement and alignment with precinct partners
3. Support Indigenous health
4. Grow Clinical Trials capacity and participation by embedding research into clinical care for all
5. Utilise digital health tools to streamline our research endeavours to improve care across all services

Our history of research

The Melbourne Hospital was established in 1848 as Victoria's first hospital and has engaged with research and teaching over its 170-year history. Following the establishment of The University of Melbourne (UoM) Medical School in 1862, The Royal Melbourne Hospital undertook the training of medical students from 1864, and the formal training of nurses from 1890. In 1915 the oldest research institute in Australia, the Walter and Eliza Hall Institute of Medical Research (WEHI) was established in the recently rebuilt Melbourne Hospital, the beginning of a close collaboration in clinical and laboratory research between the hospital, the University and WEHI. This relationship was exemplified by Sir Macfarlane Burnet, an Australian virologist, Director of WEHI from 1944 to 1965 and a Nobel Prize winner in 1960, who led the Clinical Research Unit at the Royal Melbourne Hospital until his retirement in 1978.



In 1955 the University appointed the James Stewart Professors of Medicine and Surgery at the Royal Melbourne Hospital, Head of the University Departments of Medicine and Surgery respectively. In 1963, the Cato Chair of Psychiatry was endowed, to provide academic leadership in psychiatry at the Royal Melbourne and NorthWestern Mental Health. These endowed professorial appointments embedded academic medicine in leadership roles at the Royal Melbourne Hospital, bridging the University of Melbourne and the Royal Melbourne Hospital in teaching, research and academic leadership.

Allied health and nursing research and education has been facilitated by collaborations between The University of Melbourne, LaTrobe University, Australian Catholic University and Victoria University. These relationships enable the further education and development of research capacity in both disciplines and are cemented through the appointment of positions including the Professor in Allied Health and Director of the Nursing Research Hub in 2019

Our services: the settings for research

The Royal Melbourne Hospital

As one of the largest hospitals in Victoria, The Royal Melbourne Hospital (RMH) provides a comprehensive range of health services across two main campuses. The City campus provides general and specialist medical and surgical acute services. Sub-acute services, including rehabilitation and aged care, outpatient and community programs are provided from the Royal Park campus.

The RMH plays a key role within the broader Victorian health sector as a major Victorian referral service for specialist and complex care and as one of the two designated state-wide adult trauma services. It also contains centres of excellence for tertiary services in several key specialties including neurosciences, nephrology, surgical oncology, cardiology, immunology and genomics.

The RMH has a comprehensive clinical research program that embeds Clinical Trial Services across all service departments and operates in harmony with the broader RMH operational network.

NorthWestern Mental Health, part of The Royal Melbourne Hospital

As the largest provider of mental health services in Victoria, NorthWestern Mental Health (NWMH) works in partnership with consumers and carers to provide a comprehensive suite of general and specialist services to youth, adult and aged people within the community and residential and health services. Services are delivered through six programs spanning 32 sites across the northern and western suburbs of Melbourne. It also delivers a number of state-wide specialist services including the neuropsychiatry service, the eating disorder service and the Orygen Specialist Program.

The Peter Doherty Institute for Infection and Immunity

The Peter Doherty Institute is a joint venture between The Royal Melbourne Hospital and The University of Melbourne. It is a world-class institute that integrates research into infectious disease and immunity with teaching excellence, reference laboratory diagnostic services, epidemiology and clinical services.

A snapshot of research at Royal Melbourne Hospital

Currently

1246

active research projects

6,700+

publications in the last 5 years

Including

4,800+

journal articles

50%

of total publications with international collaboration

of which,

995

are active clinical trials

121,082
citations

in the last 5 years

On average

1.79

citations per publication

Field weighted citation impact

2.9

397

are CTN clinical trials

of which,

65%

are commercially sponsored

12,000+

patient visits to the clinical trial centre since June 2017

Specialties with most research projects; Neurology, Nephrology, Clinical Haematology/Bone Marrow Transplant, Infectious Diseases, Mental Health

“As the key adult acute and sub-acute health provider in the Melbourne Biomedical Precinct, we play a major role in giving science the platform it needs to solve pressing health problems.”

The Royal Melbourne Hospital – Strategic Plan

Recent research highlights

Successes and works in progress

CANCER

Venetoclax clinical trials

Collaboration: WEHI, Melbourne Health, Peter MacCallum Cancer Centre

The Walter Eliza Hall Institute, who developed Venetoclax, an anti-cancer drug, conducted clinical trials with its health service partners, the RMH and Peter MacCallum Cancer Centre.

The trial demonstrated significant improvements for patients with hard-to-treat blood cancers, including patients whose blood cancer had relapsed or was resistant to conventional treatment.

NEUROLOGY

Mobile Stroke Ambulance

Collaboration: Melbourne Health & Ambulance Victoria

An Australian first, the Mobile Stroke Unit, hit the road as part of a trial to provide the fastest, most effective treatment to patients suffering a stroke. Time is critical when someone has a stroke and the ambulance has an on-board CT scanner capable of imaging the patient's brain on the spot so treatment can begin straight away.

GASTROENTEROLOGY

Coeliac Disease Vaccine

Collaboration: WEHI, Melbourne Health.

The world's first vaccine for people with coeliac disease is one step closer as phase two clinical trials get underway across Australia, led by The Royal Melbourne Hospital and the Walter and Eliza Hall Institute.

The trial holds the potential to protect coeliac patients from the harmful effects of gluten.

Recent research highlights

Successes and works in progress

DIABETES

Early intervention for diabetes in acute hospital care

The RMH conducted the largest cluster randomised clinical intervention trial in diabetes inpatients in non-critical care. This trial demonstrated a significant decrease in adverse glycaemic days and hospital-acquired infection. In 2018, the RMH will become the first hospital in Australia with a complete electronic system of networked blood glucose meters for all inpatients which will pave the way for future clinical intervention trials in diabetes.

NEUROPSYCHIATRY

Neurofilament light in neuropsychiatric and neurological disorders

Collaborators: NorthWestern Mental Health (Melbourne Health), University of Melbourne, Austin Health, St Vincent's Hospital

Neurofilament light is an axonal protein released following brain cell injury. Neuropsychiatry is leading a research project investigating the clinical utility of plasma neurofilament light levels across a range of neuropsychiatric and neurological disorders.

INFECTIOUS DISEASES

Viral Hepatitis B

Collaboration: Melbourne Health, The University of Melbourne – through the Peter Doherty Institute + 10 other collaborators

Researchers from the WHO Collaborating Centre for Viral Hepatitis at the Doherty Institute will lead a four year project to prevent liver cancer in people living with hepatitis.

Royal Melbourne Hospital Associate Professor Ben Cowie, Director of the WHO Collaborating Centre for Viral Hepatitis at the Doherty Institute and his team have been awarded a \$1.6 million Victorian Government grant to prevent liver cancer in people with hepatitis

Recent research highlights

Successes and works in progress

PATHOLOGY

Colonial Foundation Centre for Healthy Ageing

Collaboration: The Royal Melbourne Hospital Pathology, WEHI

This group will leverage developments in mass spectrometry to enable large-scale throughput for research into ageing and dementia. It will also enable the application of this testing routine pathology services, speeding the pathway to translation for clinical impact.

INFECTIOUS DISEASES

Prevention and Treatment of Covid-19.

Collaborators: The Royal Melbourne Hospital, WEHI, Doherty Institute, national and international partners.

The COVID-19 pandemic has seen the infectious diseases capacity of Melbourne Health and the Peter Doherty Institute emerge into multiple public health and experimental studies. The Victorian Infectious Diseases Reference Laboratory (VIDRL) was the first laboratory to grow COVID-19 in the southern hemisphere. Other initiatives are under the leadership of Royal Melbourne Hospital investigators: ASCOT studying treatments for hospitalised patients with COVID-19 and COVID-Shield, studying prevention of COVID-19 infection in health care workers.



Research within our organisational context

Cultivating a culture of research and maintaining our leadership position in delivering research outcomes is inherently linked our Strategic Plan **Towards 2025**. The Royal Melbourne Hospital has identified the following strategic pillars to shape its shared future.

- To be a great place to work and a great place to receive care
- Grow our home first approach
- Realise the potential of the Melbourne Biomedical Precinct
- Become a digital health service
- Strive for sustainability

Our organisational strategic goals and research priority areas align strongly and is built into our research operations. Our staff are key to delivering both great care as well as revolutionising care through clinical research. Digital transformation will enable better access to data and greater understanding of implementation science in real time. Technology will support innovative models to deliver care and conduct research, including in the home. Growing our capabilities in bioinformatics will shape our understanding of pressing health problems, help us to prioritise or research agenda. Building greater consumer engagement through the Consumer Research Advisory Group will help us to optimise consumer recruitment to research, ultimately brining the latest care to clinical setting sooner.

The current regulatory environment ensures research activities are fully integrated into those of the hospital with governing body attestation indicating the RMH commitment to our research endeavours.

The changing landscape of Health and Clinical Research

The landscape of healthcare and research is changing significantly and how we respond to these changes, challenges and opportunities is critical to The Royal Melbourne Hospital maintaining its prominence as a leader in clinical and research services.

Key drivers are:

1. Changing healthcare needs: an ageing diverse population
2. Digital Health
3. The Melbourne Biomedical Precinct
4. Translational research
5. Research operations including infrastructure
6. Patient centred research
7. The Medical Research Future Fund
8. Clinical Trials Services

1. Changing healthcare needs: an ageing, diverse population

The patient population at The Royal Melbourne Hospital is changing with increasing age and cultural diversity. Simultaneously hospitals and their traditional role in inpatient care are supported by technology development and economic factors to provide acute and subacute care as far as possible in the patient's home. This has been accelerated by COVID-19 due to the inherent risks of hospital admission.

1.5% of The Royal Melbourne Hospital inpatients are Aboriginal and Torres Strait Islanders. Clinical programs across The Royal Melbourne Hospital have identified and implemented strategies to respond to health risks for indigenous patients and their families, but we need to do more to understand emerging health needs of our local indigenous communities and ensure culturally safe care.

Greater complexity of health care needs requires an approach to health care that centres upon patient needs and outcomes. This speaks to patients and their families having a voice in how health care is delivered and how resources are best allocated.

Health services research is key to support improved models of care, optimise outcomes and reduce costs associated with providing healthcare in this complex dynamic. This will also facilitate the delivery of care centred upon the patient's home and community, critical to achieving care at home as a first priority and driving health services reform.

Key opportunity area: Innovative models of care, Health Services research, home care, research in indigenous health

2. Digital Health

Technology and capacity for data linkage will be one of the biggest enablers for improved patient care, communication and health outcomes research as The Royal Melbourne Hospital implements an (EMR) with its clinical precinct partners, providing access to external datasets for outcome comparisons. The EMR will also enable patient communication, embedding Patient Reported Outcome Measures (PROMS) into clinical assessments.

Telehealth and Telemedicine

Remote patient monitoring and Video conferencing and telephone consulting is becoming an alternative to face to face health consultations where a physical examination is not required, an impetus being further driven by COVID-19. Telehealth will underpin trial participation and extend how patients are recruited and monitored. Development, evaluation and implementation of these modes of care are at the forefront of health care services research.

Artificial Intelligence and Machine Learning

There will be significant growth in enabling technology that will provide access to personal and population data. Biometric technology and the incorporation of genomics will drive personalised medicine. At a population health level this information will ensure continuous data linkage which will inform care delivered in the community.

Key opportunity areas: Bioinformatics, Access to data and digital infrastructure, genomics diagnosis, bioinformatics.

3. The Melbourne Biomedical Precinct



Photo by Peter Bennetts, courtesy of Plenary Group

The Melbourne Biomedical Precinct (MBP) cluster was announced by the Victorian State Government in 2016 with the goal to support the commercialisation of Parkville's high research output.

The MBP's strategic objectives are to:

- Increase impact through a greater focus on commercialisation
- Unlock value from digital health and big data
- Deliver the best facilities and Infrastructure
- Develop, attract and retain top talent.

The Melbourne Biomedical Precinct forms a natural partnership amongst its lead research and academic agencies with the Royal Melbourne Hospital providing access to the largest patient cohort. Access to precinct disciplines as diverse as basic sciences, population health, engineering, social sciences and the Arts provides the broadest platform for Royal Melbourne researchers to engage in cross-disciplinary clinical and translational research and leverage funding opportunities. Investment in clinician-researchers with key academic linkages with precinct partners will drive translational research at the Royal Melbourne and maximise cross-disciplinary engagement.

Key opportunity areas:

- Make the most of co-location to enhance collaboration and funding opportunities with precinct partners.
- Lead in co-appointments to support development of academic clinicians and clinical engagement by scholars in diverse disciplines.

4. Translational research

The investment by government in new grant programs such as the MRFF will focus on clinical research with impact: an investment that harnesses the frontiers science and technology and which offers potential to benefit population and patient health outcomes. Translational research is driven by the clinical problems seen in patient care and supports basic research initiatives to address these. It also provides opportunities for clinicians to engage with scientists, engineers and others to lead clinically relevant discoveries.

The environment surrounding the Royal Melbourne Hospital is extraordinarily rich in diverse basic science, bioscience, public health, engineering, social science and environmental science capacity. The opportunity provided by proximity to a critical mass of researcher and research infrastructure is a major advantage of the campus. For industry, the opportunity to develop novel compounds and conduct clinical trials in collaboration with leading academic clinicians is key to successful product development and life cycle management of existing products. The Royal Melbourne Hospital already undertakes early phase clinical translational work with its partners and should work to further this engagement with academia, public investment, grant initiatives and industry to drive translational research.

The growth of infectious diseases capacity in the precinct, underpinned by The Doherty Institute and key co-appointments in Clinical Infectious Disease and Microbiology, together with the COVID-19 pandemic have strengthened momentum and provided funding opportunities for a human infectious challenge model facility to be built at the Royal Melbourne Hospital. This would simultaneously build capacity for multi-day clinical trials to be hosted within the RMH. The Melbourne Academic Centre for Health (MACH) has also instituted, through the Faculty of Medicine at the University of Melbourne, a Clinical Trials Hub. The goal of the Hub is to support clinical trials and governance by MACH partners and will support trial expansion at RMH.

Key opportunity area:

- Translational research which engages precinct partners and advances health care recognised with success in gaining external funding
- Development of clinical trials capacity within The Royal Melbourne Hospital to support human infection challenge research and provide amenity for multi-day clinical trials.

5. Research infrastructure

Clinical research is dynamic and driven by regulatory change and advancements in technology. Key examples are in genomics, where the Genetic Medicine of the recent past has been superseded by developments in gene sequencing and bioinformatics leading to the prominence, opportunities and challenges of whole genome sequencing as a clinical tool.

Conventional medical specialities and techniques, such as biochemistry and histopathology are likely to be irrevocably changed by developments in proteomics and metabolomics that are underpinned by developments in high-throughput mass spectrometry. The availability of such technology and the critical mass of knowledge and human capital that underpins its application will drive clinical and research developments in the next decade and beyond. These developments are underpinned by infrastructure investments that are being made in the precinct. Simultaneously, translation of the potential of these technological developments to clinical impact will be through the engagement in academic medicine within relevant disciplines. The Royal Melbourne Hospital should leverage this local infrastructure investment to drive clinical research that is at the forefront of medical science globally.

Key opportunity area: Engagement with precinct infrastructure to implement cutting edge technology into practice; the advancement of Clinical Registries, more dynamic study designs; and use of existing infrastructure to be world-class to support the complexity of today's clinical research endeavours.

6. Patient centred research: patients as consumers

Clinical research is ultimately about improving the health, wellbeing and quality of life for patients and clients. To get the most out of this research requires strong consumer engagement. Historically, healthcare has always been delivered to patients, but not always delivered in partnership with patients.

Patient centred partnerships and care will demand that clinical research outcomes are measured not only by clinical endpoints but by measures reported from patient outcomes.

The evolving dynamics of the delivery of care and research require patient focus, accountability and the incorporation of patient outcomes and priorities. This will mandate the formation of a consumer advisors to research which informs and drives the priorities and provides advice on the acceptability of research questions and strategic directions.

Key opportunity areas: closer consumer engagement, co-design

7. The Medical Research Future Fund

The Medical Research Future Fund (MRFF) is a \$20 Billion Australian Government investment in health, research and research translation and aims to improve the health of Australians, the sustainability of the health system and to grow Australia's strong biological and medical technology sector.

The MRFF has four streams,

- Patients – meet the health needs of patients with increased access to national and international clinical trials and the development of new treatments and cures
- Researchers – fellowships and development opportunities for medical researchers
- Research Missions – ambitious programs of work to tackle significant health problems, only possible through collaboration, leadership and investment.
- Research Translation – bringing findings from the lab to hospitals and clinics sooner

Key opportunity areas: Cross-disciplinary collaboration with our research and academic partners and consumers through research grants, fellowships and joint appointments to enhance chances of success.

8. Clinical trials

The Clinical Trials Governance Framework

Clinical trials are a major component of care at Royal Melbourne Hospital and key to its position as a leader in health care. There are opportunities for expansion of commercial and investigator initiated trial participation which will support and drive clinical care innovation. Clinical trials are underpinned by research Ethics and Governance frameworks that enables their conduct and ensures rigorous ethical and governance standards are maintained so that consumers can trust that trial activities are conducted to the highest standards.

The Australian Commission on Safety and Quality in Healthcare is the national body that leads the development of the National Safety and Quality Health Service Standards by conducting accreditation assessments of all health providers. The framework will seek to ensure that all clinical trials are high quality, integrated into the provision of care, consumer focused and undertaken in a safe environment. Health services conducting clinical trials Australia-wide will be assessed on the integration of the framework into all aspects of RMH operations and services as part of their regular accreditation cycle. For hospitals, this process will provide greater scrutiny of research ethics and governance processes as well as the general conduct of research studies.

In addition, the Governance Framework will ensure the provision of Clinical Trial Services are fully embedded into RMH operations with full transparency at the Executive level thus ensuring best clinical research practice is met.

Key opportunity areas:

- The Clinical Governance Framework will provide external validation of research clinical trial services conducted at RMH
- Development of clinical trials capacity within RMH to support clinical trials and expand capacity in infectious disease challenge to meet strategic directions.

“From supporting scientific breakthroughs, drug development and innovative models of care, to backing new technology products and services – with our partners, we are well positioned to do great things.”

The Royal Melbourne Hospital – Strategic Plan

Advancing health for everyone, every day

Our research strategy

The Royal Melbourne Hospital is recognised locally, nationally and internationally for its clinical care and research, with multiple areas of excellence across several clinical domains, high rates of collaboration nationally and internationally, the highest number of publications of all health services in Victoria and a leader nationally. Achieving and sustaining this requires maintaining a focus on achieving excellence and advancing health outcomes whilst supporting academic clinicians and research leaders, facilitating collaboration and translational medicine whilst educating supporting the clinicians and researchers of tomorrow.

The expertise and time to deliver high quality research requires a culture that values research and invests in its opportunities by recognising that that research is fundamental to the delivery of excellent clinical care and will drive implementation of new practice. This will underpin the contribution to research by the organisation, and the health and wellbeing of its communities.

For the Royal Melbourne Hospital to maintain its leadership position in clinical care, research informs and drives responses to the changing health landscape while continuing to explore new opportunities and collaborate broadly: integral to a successful research program.

Defining research priorities for the Royal Melbourne Hospital requires a focus on current research strengths, identifying promising growth areas and clinical services that require further development. This is a dynamic area and will be supported by the formation of a Research Advisory Committee which can provide oversight and advice as to the direction of research at the Royal Melbourne.

Advancing health for everyone, every day

Our research strategy

Strategic priorities for research via embedding clinical research into hospital operations

- Foster the development and retention of clinician scientists to drive clinical practice innovation and quality
- Drive translational research through engagement with precinct partners
- Grow clinical trials capacity and participation and include linguistically diverse participation in research to improve care for everyone
- Employ bioinformatics to improve care and drive Health Services research
- Support indigenous health

Fundamental to grow our research program and achieve our strategic research goals to become the sector leader

- Supporting translational research through engagement between clinicians, patients, academic partners and industry
- Maximise success in obtaining competitive grant and industry funding
- Leveraging the opportunities in the precinct in basic science, technological capacity and cross-disciplinary research
- Improving research governance, support functions and infrastructure to support research to maximise research participation and enable NCSQHC accreditation
- Increasing research profile through publications, translation, leadership and engagement with the community

Each of our strategic responses will have an impact on at least one of these research fundamentals

1. Foster the development and retention of clinician scientists to drive clinical practice innovation and quality

The engagement of The Royal Melbourne Hospital with under and post-graduate clinical training and research renders the Hospital an attractive proposition for established and emerging clinician-scientists.

The close proximity of Royal Melbourne Hospital with its partner hospitals to The University of Melbourne and research institutes in the heart of the Melbourne Biomedical Precinct means that many opportunities exist for collaboration and for clinical leaders to be geographically full time, working in joint appointments across the precinct. Training at The Royal Melbourne Hospital is enhanced by proximity and leveraging the rich research infrastructure of the precinct, including genomics, proteomics and bioinformatics. The RMH, through the Office for Research, supports researchers in all aspects of compliance, approvals, streamlining research submissions as well as providing regulatory capability to sponsor investigator-initiated research studies.

The Royal Melbourne Hospital employs many senior clinical leaders with highly successful clinical research careers. This remains a key draw card for clinical trainees and emerging researchers working with leaders in their field. Maintaining the high calibre clinical and research workforce and ensuring the next generation of clinician-scientists is a constant challenge and something that is recognised both at The Royal Melbourne Hospital and across the Melbourne Biomedical Precinct. Recruitment of senior clinical leaders by joint clinical and academic appointments with the University of Melbourne cements clinical and academic leadership at The Royal Melbourne Hospital and attracts junior clinicians and specialist trainees with academic aspirations.

The Melbourne Academic Centre for Health has implemented an integrated PhD program with advanced clinical training. The Royal Melbourne Hospital is a partner in this program appointing young clinicians of exceptional academic potential.

1. Foster the development and retention of clinician scientists to drive clinical practice innovation and quality

The Medical Research Future Fund recognises the benefits of the Clinician-Scientist role and how bringing together of basic science, clinical research and direct clinical care can fast track research translation. This is evidenced by funding streams that support research fellowships and professional development, collaboration and research translation.

In order to make the most of the opportunities presented by Medical Research Future Fund and to cement our leadership position as the centre of adult general and specialist research in Victoria, we still have work to do. Defining and embedding distinct career pathways for clinician-scientists for both emerging researchers and distinguished clinician-academics as future leaders across the hospital is key to retaining our research crown in the future

Priority actions:

Increase joint clinical and academic appointments, including hospital leadership appointments as well as early and mid-career researchers.

Increase investment in training and mentoring for emerging researchers and the development of clinician-scientists career pathways with our partners, in particular the Melbourne Academic Centre for Health (MACH), WEHI, Florey Institute and The University of Melbourne.

Support the appointment of academic early and mid-career researchers through funded fellowships which complement clinical appointments.

2. Drive translational research through engagement with precinct partners

The Royal Melbourne Hospital has long enjoyed strong research partnerships and collaborations with The University of Melbourne, The Walter Eliza Hall Institute of Medical Research and the Florey Institute of Neuroscience and Mental Health. Over the years the evolution of the Parkville Precinct into the broader Melbourne Biomedical Precinct has and continues to create further opportunities for cross-institutional collaboration to unlock commercial value and benefit our precinct more broadly.

Collaboration is essential for The Royal Melbourne Hospital to maintain research prominence. Alignment of areas of research focus at the Royal Melbourne Hospital with key research partners will drive discovery and improvements translational medicine to benefit patients. Our partners have an evolving focus and established investment in genomics, proteomics and bioinformatics which are already being employed in collaborative science in disease detection, healthy ageing, mental health and optimising healthy brain function, all of which are vital to treat the growing number of aging, complex patients presenting in the contemporary health environment. There may also be creation of new knowledge and products of commercial potential which may be employed to benefit the Hospital, our partners and the broader Victorian economy.

The launch of the precinct EMR is a flagship collaboration project that will augment the clinical care relationships between The Royal Children's Hospital, The Royal Women's Hospital, The Peter MacCallum Cancer Centre and The Royal Melbourne Hospital. The EMR will support care transitions between organisations, provide a mechanism for care standardisation and collaboration, to drive care standards and create a harmonised platform for health services research.

2. Drive translational research through engagement with precinct partners

Priority actions:

Support relationships with our priority research partners; The University of Melbourne, The Walter Eliza Hall Institute for Medical Research, The Florey Institute of Neuroscience and Mental Health and the Peter Doherty Institute through

- Alignment of research priorities for investment
- Joint appointments, fellowships and pathways to enable a career in translational medicine
- Development of key technology infrastructures to support discovery research and clinical care

Work with our partners to enhance how we access collective human capital, reduce duplication of services and leverage our joint reputations to make the most of opportunities arising from the MRFF, NHMRC, philanthropic and industry funding.

3. Support Indigenous health

Life expectancy of Indigenous Australians is 10 years lower than non-Indigenous Australians with most of the health gap in premature mortality arising from cardiovascular disease, renal disease, injuries, cancer and diabetes. Closing the Gap Health Targets, are working to close the gap in indigenous life expectancy.

Whilst there are multiple groups across The Royal Melbourne Hospital undertaking Indigenous Health research, we need to enhance our efforts and have a more coordinated approach to ensure our research is translated into clinical practice to improve the health and wellbeing of this patient population by engaging with indigenous leaders to direct and inform investments in indigenous health. Most importantly, we need to engage with the local indigenous community that we serve to direct our research endeavours.

Priority actions:

Improve understanding of the health care needs of indigenous people

Consult with our local community to ensure that care at The Royal Melbourne Hospital is supportive of local indigenous communities

Through research identify initiatives to improve the health of our Aboriginal and Torres Strait Islander patient population

4. Grow clinical trials capacity and participation

Clinical Trials are key to making new discoveries and bridging the gap between pure science, technology, patient care and outcomes. They are the centre of developing new diagnostic procedures, new drugs or devices or the new application of existing technology in novel ways to improve patient care and outcomes

The Royal Melbourne Hospital has a very strong track record of conducting high quality clinical trials as part of local, national and international collaborative research projects. Increasingly, receiving clinical care as part of a clinical trial is standard practice. As a result the integration of the National Clinical Trials Governance Framework will add further assurance that the care delivered through conduct of a clinical trials is at least equal and likely superior to conventional care models.

Investment in digital tools and streamlined processes that make engaging in research with The Royal Melbourne Hospital an easy undertaking are key to embracing the future challenges of an increasingly competitive research landscape. Infrastructure and resources that support the day to day functions and processes for initiating, conducting and monitoring research play a significant role in the efficiency of the organisation's research program and mandate institutional support, such as Clinical Ethics Committees, transparent yet rigorous governance processes and the capacity to report to overarching bodies such as the National Commission on Quality and Safety in Health Care. The Royal Melbourne Hospital will need to empower and educate potential investigators and emerging researchers to initiate clinical research, engage with funding agencies and optimise trial recruitment through utilisation of the EMR.

4. Grow clinical trials capacity and participation

The reality of the COVID-19 pandemic has emphasised the importance of infectious diseases research and the capacity for vaccine development that exists in the precinct. Key to this is the implementation of a Human Infection Challenge facility at the Royal Melbourne to support early phase vaccine trials and multi-day stay research capacity in the precinct. The introduction of the MRFF provides further opportunities to seek support for The Royal Melbourne Hospital to deliver clinical trials and translation of research into clinical practice with our strategic partners and as part of broader research alliances.

Priority actions:

Enhance consumer engagement and support research recruitment with the establishment of the RMH Consumer Research Advisory Group

Identify, educate and support clinician-researchers to provide academic leadership, driving new clinical trials activity across their discipline and enhancing their profile as Key Opinion Leaders

Expand clinical trials capacity to maximise engagement with clinical trials, participant enrolments and encourage clinicians to increase collaborative multi-site research

Implement the National Standards for Clinical Trials and embed this into The Royal Melbourne Hospital Clinical Governance and Quality Framework.

Support the development of a Human Infectious Disease Challenge facility which will also support multi-day clinical trials.

5. Employ bioinformatics to improve care and drive health services and implementation research

Digital health in general, and the implementation of the precinct EMR, in particular, will provide an immense opportunity to leverage data to support research right across the research continuum, from developing a research question, translation at the bedside and health services research evaluating clinical developments and the efficiency of new care models.

Informatics afforded by an EMR and other digital health data sources will:

- provide researchers with a rich source of patient data to inform the development of clinical research questions and evaluate care delivery
- provide the capacity to rapidly interrogate data at scale
- improve capability for clinical trial feasibility assessments
- provide metrics for clinical trial participation
- support patient recruitment to research studies
- Unlock the commercial potential of the Melbourne Biomedical Precinct by providing clinical data that spans the continuum of clinical practice from hospital to community

Capability in clinical informatics and analytics will support the development of the clinical research program and assist researchers as they seek advancements in patient diagnostics, treatments and care. This will require investment to harness the potential of an electronic medical record to interrogate data and to enable the data linkage which can provide outcomes information. Engagement with precinct opportunities and internal infrastructure such as BioGrid will support this.

5. Employ bioinformatics to improve care and drive health services and implementation research

At the heart of research translation is the application of research into clinical care delivery to improve patient outcomes. While clinical trials are the gold standard of determining effective treatments, implementation and efficiencies can be driven by Improvement and Implementation Science and Health Services Research. Applying Improvement Science in clinical care delivery can improve systems, processes and ultimately outcomes, and, alongside Implementation Science, optimise the implementation of new processes to ensure research impact is maximised. Implementation science mandates the use of Patient Reported Outcome Measures (PROMS) which ensures that care delivery brings the patient perspective to the centre of evaluations. Improvement and Implementation Science, along with Health Services Research which looks at population access, cost, efficiency and efficacy of health services, are key skills we need to better translate research from bench to bedside and support the research directions of the Royal Melbourne Hospital.

Priority actions:

Invest in, develop and support expertise in Clinical Informatics and Analytics to assist in research across the organisation and develop new models of care

Build capability in Improvement and Implementation Science and Health Services Research

Utilise the capacity of the EMR to support quality initiatives

Ensure that patient reported outcome measures are incorporated in trial design and service development.

Defining what success looks like – by 2025

- A cadre of early and mid-career academic clinicians with joint University appointments who can lead research and clinical innovation
- Translational research capacity is enhanced evidenced by cross-precinct collaborations, publications and competitive grant success
- Clinical trials are well supported and the Human Infection Challenge facility operational
- Building the support framework for the growth of the next generation of Key Opinion Leaders
- Clinical Trials Services fully embedded into RMH operations to demonstrate visibility and a commitment from the governing body to the research endeavour.
- Bioinformatics supports health services and implementation research
- Indigenous health and research is a priority in the precinct with a relationship to local communities
- Increased patient participation in trials and ensuring trials are accessible to everyone

Advancing health for everyone, every day

