



RANDWICK HEALTH &  
INNOVATION PRECINCT

The future of lifelong health

# TRANSLATIONAL RESEARCH STRATEGY 2021 – 2024



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## ACKNOWLEDGEMENT OF COUNTRY

Randwick Health & Innovation Precinct partners acknowledge the Traditional Custodians on whose land the Precinct stands and pay respect to the Bidjigal and Gadigal peoples who traditionally occupied the Eastern Suburbs Coast.



# RANDWICK HEALTH & INNOVATION PRECINCT

The future of life-long health.

By harnessing our collective strengths, we can transform health care now and into the future. For more than 60 years, we have aspired to integrate health, research, industry and education to improve the health outcomes of our community.

Our four founding partners, the South Eastern Sydney Local Health District, Sydney Children's Hospitals Network, UNSW Sydney and Health Infrastructure are working together to deliver a transformative and collaborative place of excellence, solving global challenges to enhance and nurture lifelong health.

Supported by a \$1.5B infrastructure investment, we have more than 15 collaborating partners, a 22,000 strong precinct campus workforce who, each year, deliver 1.8 million patient interactions and educate over 58,000 students. The Randwick Health & Innovation Precinct (RHIP)'s genuine partnerships leverage our scale, diversity and expertise to influence and impact positive health outcomes.

**We are a precinct with a difference.**

# WHAT IS TRANSLATIONAL RESEARCH?

**Translational Research is a commonly used term in medical research** which explains how researchers 'translate' basic science discoveries from the laboratory into clinical application. The purpose of this research is to improve how we prevent and diagnose health conditions, discover new treatments and improve the way we help patients for better outcomes. Cancer research is one area where translational research has proved enormously effective where researchers, clinicians, and industry has collaborated to develop targeted treatments which vastly improve health outcomes.

Consumer-led, person-centred approaches enhance research quality at the Precinct. Partners collaborate to share resources and develop capabilities, strategies and tools to create an environment that is innovation-driven and well-supported by translational research pathways to address the wicked health problems of our time.

Translational research accelerates innovation in healthcare. Implementation of the new knowledge highlighting new methods in clinical best practice published in journals, guidelines and government reports delivers benefit to patients. Policy, communication and advocacy have a large part to play in ensuring that such research has its desired impact on society. In other instances, a technology solution may be the route to address a particular problem. This is where internal innovation generating new intellectual property and collaboration with industry has a large part to play in converting new inventions into life-improving products serving patients' needs.

Our research focus areas: mental health and neurosciences, big data, virtual care, biomedical science and next-generation technologies and imaging, fertility, precision medicine and genomics and childhood cancer research translated to excellence in clinical care, place us at the forefront of medical and health innovation in Australia.

Precinct research partnerships and resourcing attract high calibre, internationally recognised researchers. Partner investment nurtures and enhances existing talent and capacity, supporting leading researchers as well as investing in the next generation of researchers. Enabling spaces across the Precinct will accelerate innovation and test new treatment models through clinical research, health services research and clinical trial activity. Inspired by the people, resources and spaces at the Precinct, our research teams will find answers to the big health questions that will save lives.

The aspirations of the Precinct reflect the big health issues of our time and will see researchers engaging in multi-disciplinary population health research that addresses infectious disease, climate change and health, behavioural health, technology and equitable access to health.



“Embedding research into clinical care means huge improvements in patient health outcomes. Our mission has always been better value health care.”

- Professor Adam Jaffe, Paediatric Respiratory Consultant at Sydney Children’s Hospital, Randwick and the John Beveridge Professor of Paediatrics and Head of School of Women’s and Children’s Health at UNSW. Co-lead RHIP Translational Research Working Group

## OUR RESEARCH PRIORITIES



Children’s  
Cancer



Neuroscience, mental  
health & addiction



Virtual  
care



Genomics and genetics -  
personalised medicine

“The difference at this precinct is our inquiring minds, we are always challenging how we can do better. Research never sleeps and we are committed to pushing the boundaries for better value health care.”

- A/Prof. Chris White, Director of the Department of Endocrinology at the Prince of Wales Hospital and a Conjoint Associate Professor of Medicine at UNSW. Co-lead RHIP Translational Research Working Group

RHIP is recognised globally in the areas of children’s cancer and neuroscience, mental health and addiction. It aspires to lead in the areas of virtual care and genomics and genetics – personalised medicine.



# OUR CURRENT AND EMERGING STRENGTHS

The RHIP is a health-dedicated innovation precinct. Its research and services support the entire lifespan with leading adult and children's teaching hospitals, a cluster of medical research institutes and centres and a Go8 university within its community. UNSW's history is steeped in a rich association with medicine, applied science and engineering with broad capabilities in adjacent disciplines such as social policy, law, business, social sciences and the arts.

We are renowned in the areas of population health, oncofertility research, infectious disease, immunity and inflammation and imaging.

However, RHIP's translational research strengths continue to evolve and grow as our networks develop. We foster an environment that will harness what we know and explore what we don't know.

Our research continues to emerge across a range of disciplines with a singular goal, improving the lives of our patients.

## Advancing virtual care models through interdisciplinary collaboration









The TeleClinical Care – COVID-19 (TCC-COVID) app addressed the challenge of safe and efficient remote monitoring of large numbers of people with COVID-19 in the community while managing high demands on emergency and inpatient services. The app enables patients with COVID-19 who are isolated at home to be monitored virtually by an experienced medical team.

TCC-COVID built on the success and partnerships arising from the Precinct's Total Cardiac Care – Stroke collaboration, a comprehensive smartphone application-based model of care designed to improve outcomes in heart failure and stroke patients. TCC-COVID was rapidly adapted and deployed as a model of care which included a pulse oximeter that measures oxygen saturation as well as pulse rate and symptoms included in the original cardiovascular version of the app. It is connected to a back-end clinical database with inbuilt data analytics and alert systems. Patients enter results into the TCCCOVID app twice daily and complete a symptom questionnaire via the TCC-COVID app once daily. This process takes patients approximately 5 minutes.

The app, developed by the Biomedical Engineering team at UNSW, captures information on a patient's blood oxygen levels and heart rate and sends it back to a team of specialists based at the Prince of Wales Hospital. Alerts are triggered if the patient deteriorates or if there are no updates within a given timeframe. In the case of an alert, the central monitoring service contacts the patient to check on their safety or to determine if they are experiencing any technical issues. The deployment of TCC-COVID was a collaborative effort between the NSW Government, Prince of Wales Hospital, South Eastern Sydney Local Health District, UNSW Sydney, The George Institute for Global Health – a UNSW affiliated medical research institute, NSW eHealth and Microsoft Australia.

TCC-COVID demonstrates that the scale, diversity and world-class expertise on the Precinct can transform the personalised and compassionate care that patients receive. Working together and supported by industry, collaboration across the Randwick Health & Innovation Precinct will make a huge difference in people's lives.

## Research strengths, emerging priorities, capabilities and our enablers.

Strengths	Priorities	Capabilities and Enablers	
 <b>Children's Cancer</b>	Rare disease Women's health	Cellular therapies Health informatics	Clinical trials Health informatics
 <b>Neuroscience, Mental health &amp; Addiction</b>	Engineering: robotics Augmented reality Optics and radiometry eye health	Imaging Rehabilitation of brain, spinal cord, congenital and acquired limb deficiency Nanotechnology	Non-invasive screening and diagnostics Injury prevention Surgical and Orthopaedic
 <b>Population Health</b>	Health Systems	Big Data	Health economics and systems research
 <b>Infection Inflammation Immunity</b>	RNA Therapeutics Health equity for priority populations	Health and climate change	Population health
 <b>Oncofertility</b>	Children and young women	Fertility Research Centre	Women's Health Institute
 <b>Imaging</b>	Medical imaging analytics	Research Imaging NSW	Artificial intelligence and machine learning
Emerging strengths	Priorities	Capabilities and Enablers	
 <b>Virtual care</b>	Health system performance Cardiology Palliative care	Artificial Intelligence Engineering: health sensors Mobile applications	Electronic Medical Record research Wearable technology
 <b>Personalised Medicine</b>	Genomics Engineering: 3D bioprinting, cyborgs Metabolic disease	Bioinformatics Integration of health and the built environment Food research	Data science and analytics Health Literacy Exercise physiology

## Research collaborations in cancer and fertility mean that cancer survivors have the opportunity to preserve their chance to have children

The Fertility & Research Centre (FRC), is the first dedicated oncofertility centre in Australia and is the only fertility centre to combine basic and clinical research with comprehensive fertility preservation, assisted reproduction treatment and psychosocial support in the public hospital setting.

A collaboration between UNSW Sydney and the South Eastern Sydney Local Health District's Royal Hospital for Women, the FRC offers both low-cost IVF treatment and on-site fertility preservation services for young people with cancer and rare genetic diseases. The services are offered to people across NSW and is led by Professor William Ledger, Professor of Obstetrics and Gynaecology at UNSW and Director of Reproductive Medicine at the Royal Hospital for Women.

Professor Ledger said the service is linked with the Kids Cancer Centre at Sydney Children's Hospital. The oncofertility services are available to patients diagnosed with cancer to preserve fertility before undergoing chemotherapy.

"Cancer patients diagnosed at Sydney Children's or Prince of Wales Hospital can speak with doctors about fertility preservation the very same day they are told they need chemotherapy," Professor Ledger said.

Since opening in April 2020, over 95% of the FRC's oncofertility patients have been seen within 48 hours of their referral. The centre received 249 referrals and completed over 120 oncofertility procedures for egg or embryo freezing in 2021 despite COVID-19 restrictions. It will complete more than 200 procedures in 2022.

The FRC provides the statewide oncofertility service for women and men across the whole of NSW.

"Many young people will encounter cancer in their lives, and loss of the chance to have a family is amongst the top causes of distress in young cancer survivors. Chemotherapy and radiotherapy will treat their cancer but may destroy their store of eggs or ability to make sperm. The answer is to preserve fertility by taking quick and pre-emptive action by freezing sperm, eggs or embryos," Professor Ledger said.

"We also offer genetic screening of embryos, helping to eliminate devastating genetic disorders from future generations as well as counselling and psychological support."

The FRC exemplifies 21st-century collaboration that brings together clinicians, scientists and interdisciplinary teams in the Randwick Health & Innovation Precinct which will better integrate the University with the adjacent Randwick hospitals.

"What we're doing really reflects the meaning of translational research," Professor Ledger said.

"On one side we have an outstanding group of doctors, nurses and embryologists supporting patients. On the other, we have these amazing scientists who are solving research problems. The Precinct links us together and helps us connect the dots. We wouldn't be able to do what we do successfully without our working relationships, our proximity to each other and the sharing of our resources and knowledge."

"As a result, we are achieving world-firsts in fertility, genetics and imaging. It's hugely inspiring work that is improving lives," he said.

One example of his precinct collaborations is his work with Professor Ewa Goldys at the ARC Centre of Excellence for Nanoscale Biophotonics at UNSW Engineering. Professor Ledger's clinical embryology team take a single image of each unfertilised egg and send it to Professor Goldys and her team over a fibreoptic cable linking the Royal Hospital for Women clinical embryology laboratory with UNSW research facilities. She examines the image using artificial intelligence assisted deep radiomic imaging and predicts which eggs can be fertilised successfully.

"She's been right 86% of the time, a clinically useful advance which will be of practical use in deciding how best to help our patients," Professor Ledger said. Their collaboration will create translational methodologies which will be applicable well beyond oncofertility and across a broad range of challenges in reproductive medicine.

"This technology isn't being used anywhere else in the world, and it's only possible because we're working closely together and sharing our expertise."

Professor Ledger has bold ambitions for the future of the FRC, but he needs the Precinct to achieve them.

"Ultimately, we want to grow the centre so we can help more people. We can do this by moving ourselves fully into the RHIP so we can expand what we are doing utilising a bigger physical space, industry partnerships and more collaborations."

"At the end of the day, we want to improve the lives of people by improving their outcomes - helping cancer survivors have children, removing the burden of genetic disease for families, and providing low-cost treatment for people who need it."



## OPPORTUNITIES FOR COLLABORATION

### Partnering with researchers

The RHIP partner and wider network are always looking for opportunities to broaden and magnify our research impact through interdisciplinary collaboration.

We aim to connect our researchers, share our strengths and find avenues and enablers to support translational research and deliver better value health care for our community. If you are a researcher looking to expand your networks, a company looking for partner to advance the latest technology to test your ideas, please contact us to discuss how we can collaborate.

### Our partnership with industry

We will ensure industry partnerships help deliver on health outcomes and bring value to the Precinct. Industry partnerships are central to progressing bold ideas and creating impact beyond the Precinct. As well as further developing internal partnerships and collaborations, the Precinct is well-connected and open for cooperation with external stakeholders. Our Industry Prospectus outlines our key capabilities, partnership opportunities and how we are making that happen.

## CONTACT US

To find out more about our Translational Research, please contact:

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