



Faculty of Health

2021

Annual Research Highlights Report





# Welcome

Welcome to the inaugural Faculty of Health Yearly Report.

This report shines a light on our research excellence and translation across four Schools and three Centres in the Faculty and is testament to our hard work, collaboration and industry connections.

While 2021 has been an extremely challenging year, our Faculty continues its upward trajectory, delivering high quality multi-disciplinary research from the benchtop to the bedside and into policy and practice.

This report showcases just a few examples of our world-class research that is solving national and global challenges. These range from reducing the prevalence and severity of respiratory disease and diabetes for Indigenous Australians and refugees and improving the empathetic health care clinicians provide to patients and their families.

Through it all, what shines for me is the rich and diverse culture of our people, which drives innovative and inclusive research that seeks to address health inequities and transform society.

I am especially proud of the way that we embed consumers, communities and industry at the heart of what we do.

Across the many areas of our work – nursing, midwifery, public health, exercise and sports science and allied health– we are united by our passion to find solutions to wicked problems to improve health and wellbeing.

Everything we do is aimed at making people's lives healthier and, more meaningful. We seek to address problems that aren't just local or national, but global in line with the Sustainable Development goal targets that must be reached by 2030.

“Everything we do is aimed at making people's lives – healthier and more meaningful.”



I hope that reading this report will give you an idea of our research excellence across multiple disciplines, the innovative ways in which we work, but most of all how we are making a real difference.

This pandemic has shown us dramatically and powerfully the importance of health research.

Over the past 18 months, we have found ourselves thrust onto centre stage, which is not always a comfortable place to stand.

But it has contributed to a year which has been one of the most successful in the Faculty's history.

Put simply, we have never been more successful at attracting funding, or at finding solutions to intractable problems.

I pay tribute to the years of hard work by many people, who have contributed their time and skills to enable this to happen.

We are quickly maturing into an institution that is one of the best, and one of the most exciting in the world.

Let's see how we can continue to build on our success.

*Angela*

Professor Angela Dawson  
Associate Dean of Research  
UTS Faculty of Health

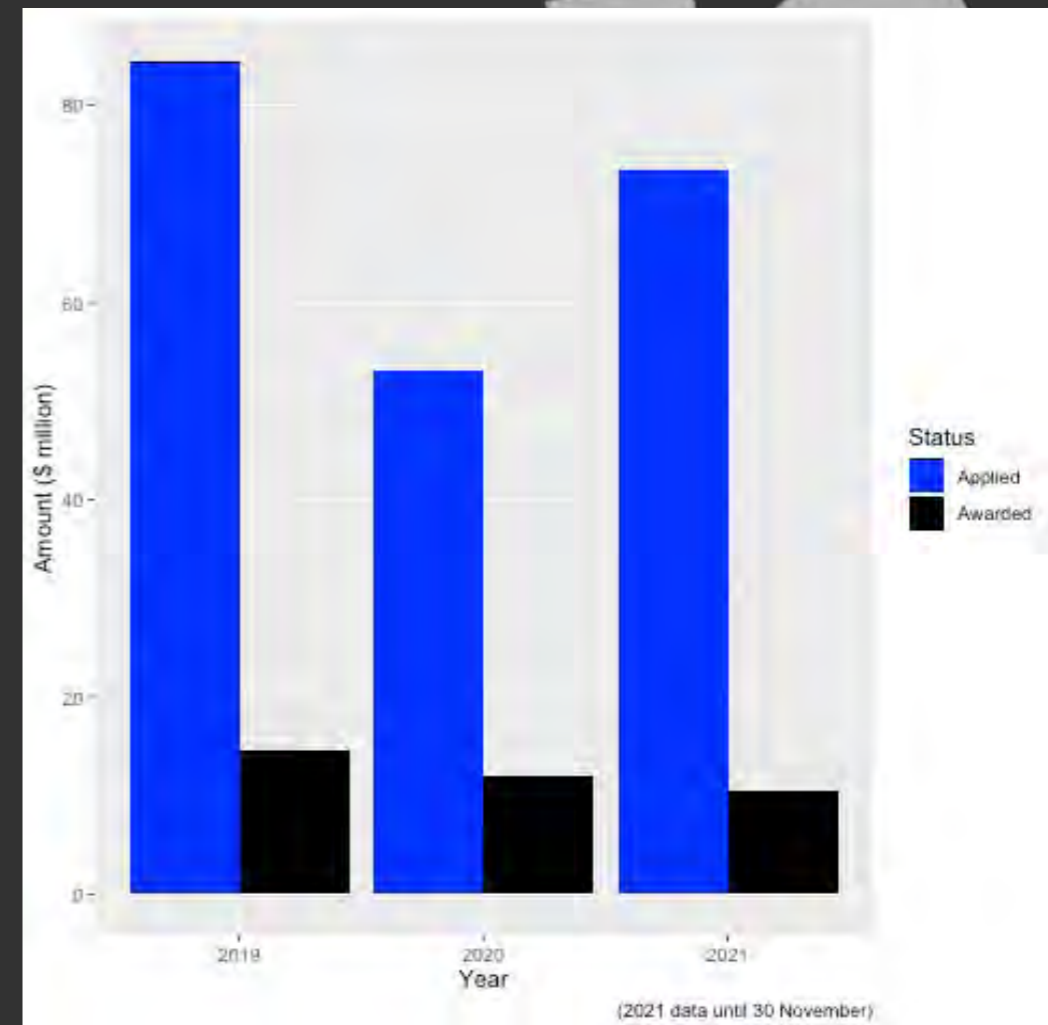


# UTS Health: Our Performance

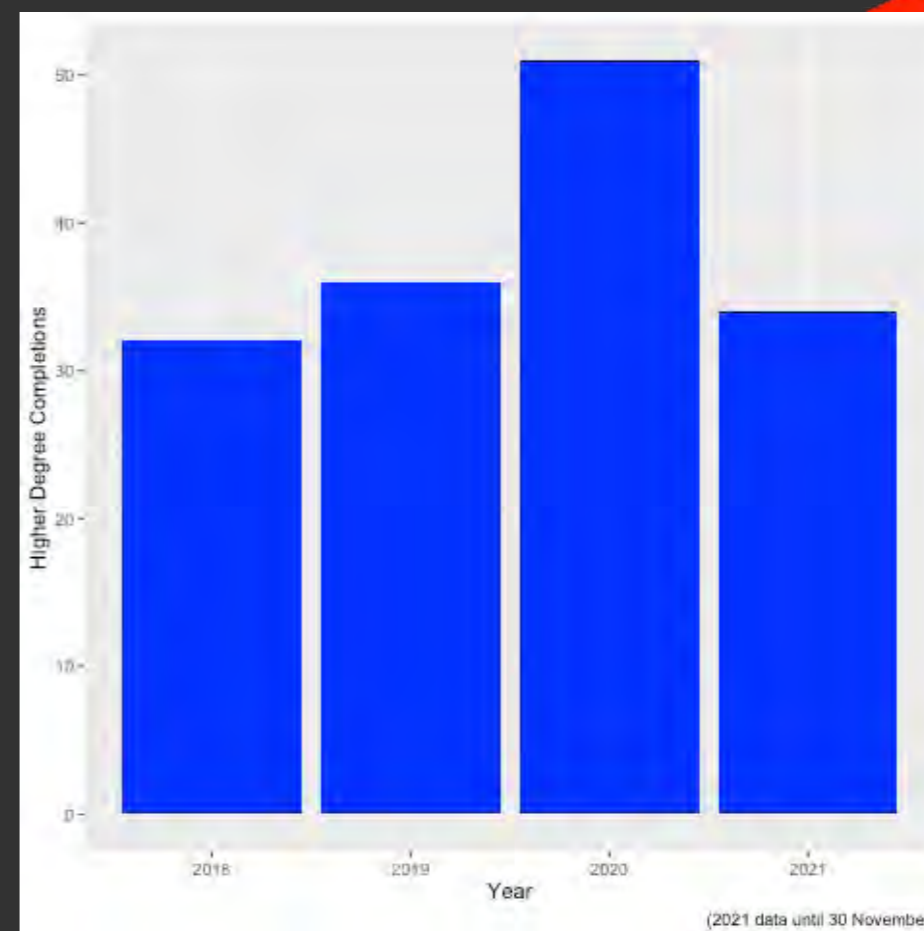
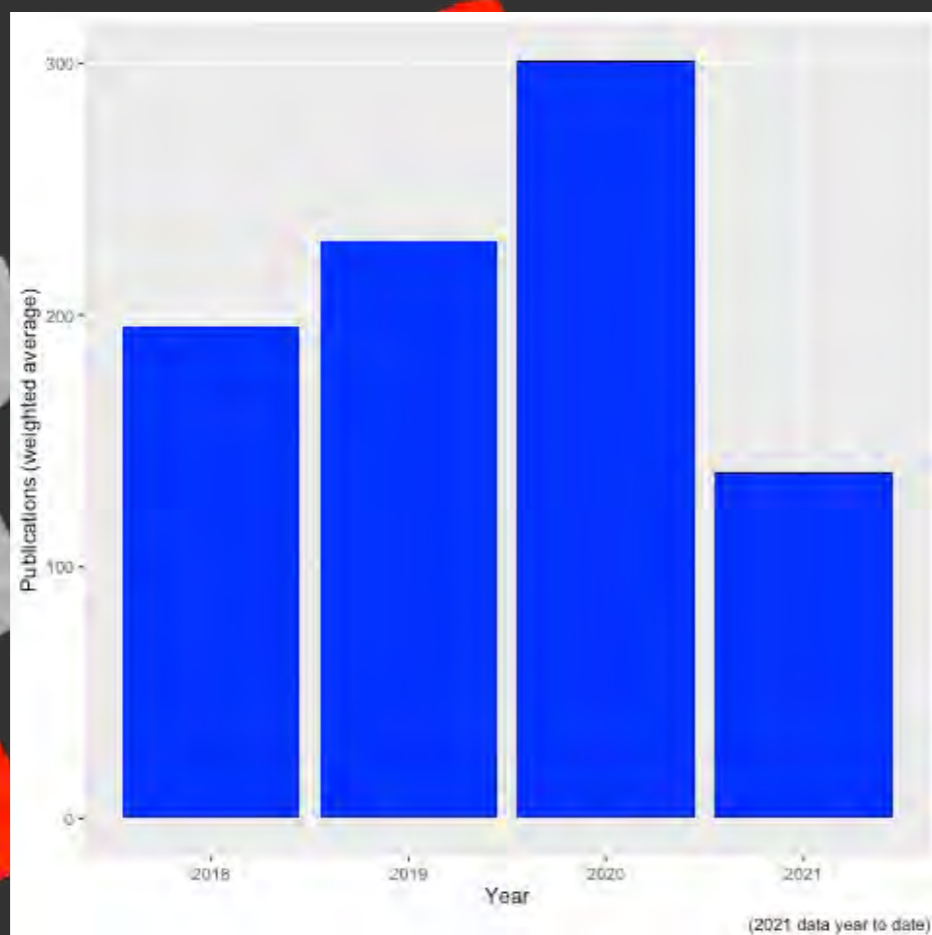
I am pleased to report on our overall research performance for 2021 YTD (November).

In terms of our External Research Grants for YTD (November), we submitted a total of \$73M in funding applications across the categories (1-4) and the faculty has been successful in being awarded \$10M in funding, a 13% success rate.

The Faculty of Health is performing favourably against its budget for 2021. The Faculty's external research income is at \$11.6M against its budget of \$10.4 M as of October 2021. The Faculty's income represents approximately 15% of the overall income of the University.



The Faculty of Health has seen 34 students complete their candidature this year with another 27 student's theses under examination. The Covid-19 pandemic has led to a slight drop in student enrolment. However, we expect that this to be rectified in 2022 and have developed a HDR recruitment strategy to promote our research excellence and potential supervisors to encourage future students (domestic and international) to consider embarking on postgraduate studies here at UTS Health.



In relation to the annual Research Outputs Collection (ROC), the Faculty is tracking, at the half year mark, with 23% of our 2021 publications having been assessed. The Faculty has a strategy in place to ensure we meet our ROC target for this year's collection.

Overall, academics and professional staff have made substantive contributions to the 2021 performance of the Faculty. With planning underway and well-defined initiatives and goals being set for 2022 we are confident in seeing our upward trajectory continue in 2022.

# What drives us?

Open in Adobe Acrobat to view this video in the PDF.

## What's our story?

Right click [here](#) to select 'view this video in a new tab' [opens external link]



# Our Impact

Stories from the Faculty



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# HOW DO YOU REACH REFUGEE COMMUNITIES AND ENCOURAGE UPTAKE OF THE COVID-19 VACCINE, WHEN SOME DON'T EVEN BELIEVE THE VIRUS IS REAL? DR ABELA MAHIMBO FOUND OUT.

At the height of the COVID-19 lockdown emergency in August, 60 people, including children, travelled to The Christ Embassy at Blacktown for worship.

They came from all over western and south-western Sydney, then the epicentre of the burgeoning pandemic.

The service violated almost every health order then in force, and resulted in fines totalling almost \$50,000 for the pastor and the worshippers.

Pastor Martin Osaghae reportedly told the congregation:

“In the name of Jesus, we refuse every lockdown in our cities, in the name of Jesus go ahead and pray.”

The event was a perfect example of the need to communicate the urgency of health orders and explore ways of promoting vaccine uptake in migrant and refugee communities.

The NSW Refugee Health Service engaged Dr Abela Mahimbo, lecturer in the School of Public Health, to explore refugees’ perceptions, attitudes, and concerns about the COVID-19 vaccines, their information needs as well as barriers and facilitators to accessing the vaccines.

The project ran from March to August.

“This was a period where there was a lot of hesitancy with concerns of vaccine safety,” Dr Mahimbo said.



Dr Abela Mahimbo

“Refugees are hard to reach. They have language barriers and therefore have limited access to mainstream media.

“Much of their information was coming from social media, which wasn’t always accurate.”

Dr Mahimbo is a trained medical doctor from Tanzania who migrated to Australia in 2012 to undertake a MPH & MHM and thereafter a PhD to examine policies and practices in immunisation service delivery for refugees.

The project targeted refugees aged over 18 years from four language-speaking groups: Arabic, Dari (Afghan), Dinka (South Sudan), and Karen (Myanmar) in southwest and western Sydney.

Because of the language barriers, she had to train bilingual community educators in the aims of the project and how to run a focus group.

What she found was both reassuring and concerning.

“Freedom, calmness, peace of mind, and the ability to travel interstate and overseas to see family – ‘a return to normalcy’ - were some of the key motivators that would drive the individuals to take up the vaccine,” she said.

“Despite the overall positive attitudes, there were concerns around the safety of vaccines which could potentially contribute to vaccine hesitancy and/or reluctance.”

The concerns of many Dari, Arabic and Karen participants mirrored those prevalent in the wider society at that time.





## REFUGEE PARTICIPANTS BY NUMBERS:

**37** participants from three language groups: Arabic, Dari, Karen and Dinka

**28%** had lived in Australia for less than 5 years

**58%** had lived in Australia for more than 10 years

## OF THE THIRTY-SEVEN PARTICIPANTS WHO RESPONDED:

**36%** were tertiary educated

**14%** were high school leavers

**11%** were primary school leavers

**14%** were English language learners

**25%** had no formal education

“These concerns were mainly attributed to vaccines being developed too quickly, the short time to test the vaccines, limited access to safety data, and side effects associated with the Astra Zeneca vaccine,” Dr Mahimbo said.

“While participants were well aware of the impacts of the COVID-19 disease, most were not eager to get the vaccine and preferred to ‘wait and see’ due to a low COVID-19 risk perception at the time that this study was undertaken.”

The attitudes of the Dinka-speaking refugees from South Sudan were markedly different.

“They didn’t believe in COVID-19, they thought it was a manmade disease, and they couldn’t differentiate between a vaccine and drug,” Dr Mahimbo said

“All Dinka participants said they would not get vaccines.

“They raised concerns about why there were different versions of the vaccines.

“There were a lot of trust issues underpinning their hesitancy, a lack of health knowledge as well as religious beliefs.”

So the next challenge was to recommend the most effective sources of information most frequently used or trusted by refugees.

“The key issue for me was the need for ongoing community engagement strategies to address the information gaps,” Dr Mahimbo said.

“Participants wanted to know why people were still getting the disease if they were already vaccinated.”



The project found that leveraging social media channels was crucial to reaching these communities.

It was also important to recruit community and religious leaders who are trusted and can speak in their language.

“These might be imams or pastors, or they could also be doctors trained overseas but highly regarded in the communities,” Dr Mahimbo said.

Next year, she will undertake a quantitative study of vaccine uptake levels and communication of public health measures, and experiences with COVID-19 in refugee communities.

“I am passionate about health equity and the barriers faced by migrant and refugee communities to accessing healthcare, because I have experienced those issues myself as a migrant,” she said.

## USING EXTRACTS FROM MEDICINAL PLANTS TO TREAT RESPIRATORY DISEASE HAS MANY BENEFITS. BUT HOW CAN THEY BE DELIVERED MOST EFFECTIVELY? DR KAMAL DUA BELIEVES THAT HE HAS THE ANSWER.



While COVID-19 has blighted the work of Dr Kamal Dua and his team by preventing access to the laboratory, there has been a significant silver lining.

For the past five years, Dr Dua has focused his research on inflammatory condition of all disease, with a special focus on respiratory diseases.

“It is estimated that by 2025 there will be an additional 165 million patients with chronic lung disease, all highly susceptible to infection,” says Dr Dua, Senior Lecturer in the UTS Graduate School of Health. “Without the development of more effective and efficient treatments, the social, environmental, and financial burden of influenza will be huge.” His research has attracted five grants in 2021 from a mix of industry and academic sources, both nationally and internationally.

Dr Dua, is studying why a rise in microRNAs (relatively small biomolecules) makes the body more susceptible to infection and how to target these to develop an effective treatment.

He is also looking at the most effective way to administer drugs for patients.

“My aim is to not only reduce the prevalence and severity of the influenza virus infection, but also provide a blueprint for further medical research into other respiratory diseases,” he said.



*Dr Kamal Dua*

### Highlights

- Dr Dua’s five-strong team is testing efficacy of plant-based drugs for asthma, cancer on mice
- Australian and international research institutes fund Dr Dua’s research on medicinal plants
- Human trials of plant-based medicines soon, seeking industry partner next year for bringing the research to market

“I am interested in why respiratory issues are exacerbated for a patient with asthma, cancer and chronic obstructive pulmonary disease,

His research blends his experience in drug delivery technology, biomedical sciences, immunology and microbiology.

“I am a pharmaceutical and formulation scientist who recognised that there was limited information linking knowledge acquired from various biological - cellular and molecular - approaches to drug delivery,” Dr Dua said.

His commitment to the research led him to complete two doctorates – the first in pharmaceutical sciences and the second in immunology and microbiology.

“I realised after the first doctorate that I was missing the knowledge in cellular and molecular links,” he said.

His team is designing nanoparticles that will deliver plant-based drugs or phytochemicals derived from Aboriginal traditional medicine to diseased cells inside a human body.

They use a cutting edge polymeric nanoparticle drug delivery system - visualise drug filled tiny polymer balls that break down over a number of days in the human body.



The benefits of this slow-release method are many.

“This method avoids a build up of resistance, which is a major issue in asthma medication where repeated use of inhalers and steroids can become progressively less effective,” he said.

“The most common treatment for asthma at present is through the use of inhalers such as bronchodilators and corticosteroid.

“While it helps to some extent, a prolonged use of inhalers and these chemicals induces a long term resistance thus reduce its effectiveness.

“Using polymers as a delivery mechanism also allows for a longer lasting release of drugs in the system, meaning a single weekly dose instead of multiple tablets per day.

“This improves adherence to the treatment plan by the patient.”

The focus on medicinal plants used by Aboriginal communities has resulted in testing five different active extracted ingredients including rutin, berberine, naringenin, quercetin, zerumbone.

“The best part in my research is that I am using the blend of the holistic research – most people use synthetic and chemical drugs,” Dr Dua said.

“These plant-based derivatives have negligible side effects, which makes them very effective inside the body.”

While the research is currently in vitro, in human ex vivo cells and in mice, Dr Dua is currently looking for an industry partner to take the research to stage one clinical trials and eventual commercialisation of the research.

He hopes to start treating patients within five years.

“I am really hoping that this research is going to be useful globally,” he said.

“Although I have a special focus on respiratory disease, inflammation is common to all diseases so the eventual contribution to medical science is virtually limitless.”





## Academic impact

Dr Dua's research has resulted in more than 190 peer-reviewed publications in various recognised pharmacy and pharmacology journals, with citations exceeding 6110.

He has also presented his research at more than 100 national and international conferences, published more than 25 book chapters, and four books on issues ranging from drug delivery and pathophysiological mechanisms underlying respiratory diseases, to cancer.

## ISOLATION IS A MAJOR ISSUE FOR THOSE LIVING WITH ACQUIRED BRAIN INJURY. DOCTORAL STUDENT AND SPEECH PATHOLOGIST MELISSA MIAO IS TACKLING THIS ISSUE IN MORE WAYS THAN ONE.

Australian boxer Ben McCulloch felt “fundamentally different” following a knockout loss to Russian Fedor Chudinov in Moscow in 2014.

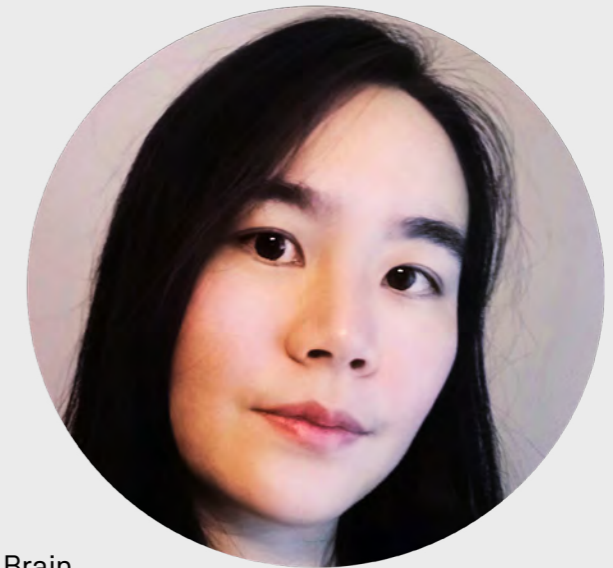
The fight ended the promising career of the 32-year-old super-middleweight champion who had been previously unbeaten for a string of 14 fights – 11 won by knockout and three by referee’s decision.

After receiving what was described as “a crunching right-hand” from the Russian boxer, he laid face down on the canvas for several minutes and required medical help before walking out of the ring.

These days, Ben McCulloch leads a very different life.

Living with a brain injury, he is a collaborator with PhD student and speech pathologist Melissa Miao in a project to help adults with acquired brain injury, their families and friends to manage communication breakdown.

“If I had to characterise brain injury in one word, it would be ‘isolation’. People with brain injury often appear superficially ‘fine’ with no head wounds or disfigurement, whereas in reality I lost the majority of my personality and capacity to relate to people for over half a decade,” Ben says.



*Melissa Miao*

The observation is important for two reasons.

First, because it goes to the heart of the Social Brain Toolkit, a suite of three online communication training interventions being developed in partnership between UTS, the University of Sydney, changineers, icare NSW and Brain Injury Australia to address this invisible disability.

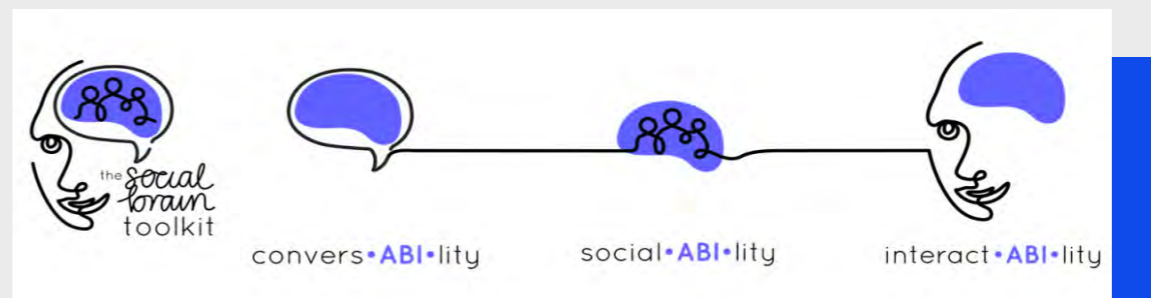
Second, it speaks to one of the radical hallmarks of this research – the inclusion of people with living experience of brain injury every step of the way.

That means their inclusion in the authorship of journal articles, and continuously receiving their input, from project inception down to the colour of the toolkit’s logo.

Monica Welsh, a clinician co-authoring this research said the work broke down barriers between users and researchers unlike anything she had seen before.

For Melissa “The most exciting part of the research is this collaboration to ensure it meets the needs of end-users. It’s a shift in and a sharing of power from researchers to those with experiential knowledge,” she said.

“They give us new insights we could otherwise never have known.”



The logo designed by Melissa with input from people living with acquired brain injury.



## What is the Social Brain Toolkit?

A suite of online interventions to support people with brain injury to communicate more effectively, whether face-to-face or online.

**interact-ABI-lity:** a short online course to help family, friends or professionals have more positive interactions with people with a brain injury.

**social-ABI-lity:** a short online course to help people with brain injury use social media safely and successfully.

**convers-ABI-lity:** an online platform for people with brain injury and their communication partners to complete a conversation skills training program together, supported by a speech pathologist.

In the [video presentation that saw her win the UTS 3-Minute Thesis Competition](#), Melissa makes the analogy with 'desire paths'.

These are trails worn into the landscape by people who ignore existing, authorised paths because they don't take them the way they need to go.

The analogy is true for too much in healthcare.

"You can make a path, but if non-one uses it, then there's not much point," Melissa said.

"Making an intervention, even if it works, is not enough.

"Most online interventions completely disappear because they are not fit for the end user in a real-world setting.

"This may be for a wide range of reasons, such as how much it changes a clinical workflow, how much it costs, how accessible the information is to the audience or what confidence they have that they will benefit."

The challenge, therefore, is not just whether the treatment works, but whether those who need it can get it.

"Desire paths are actually a dialogue between the users and designers of a city. They tell urban planners.

"This is where we want to go and how we want to get there.

"My aim is to find out what these needs are, and how we might address them right from the design stage, because this could enable people with brain injury and their families to receive this essential healthcare."

Melissa selected a framework in implementation science called the "NASSS", which stands for "Non-adoption, Abandonment, Scale-up, Spread and Sustainability", and lists key implementation challenges in digital healthcare.

She translated each implementation challenge from the framework into short, captioned videos in plain English, to create an accessible survey for stakeholders.

They were then able to rank the most important aspects that needed further research - their 'desire paths'.

"They become the decision-makers on research priorities, rather than us as academics," Melissa said.

"People say academics sit in an ivory tower where they are out of touch."

But with the input of people with living experience helping researchers address each implementation challenge, the first of three treatments in the Social Brian Toolkit - interact-ABI-lity (the ABI stands for 'acquired brain injury') - has already been used in more than 20 countries.

"Our hope is that by sharing our methods, we will inspire and encourage others to do the same and include end users in the research and design process," Melissa said.

Alex Salomon, another co-author with living experience of brain injury, says his inclusion in the project provided him with the opportunity to make a contribution to a worthwhile project, and improve his self-esteem.

For Melissa, collaborating with people living with acquired brain injury and their family and friends was a dream come true.

"It is the part of this research that I feel most passionate about, and it has been even more rewarding than I hoped," she said.

"They are the touchstone for me of what matters, and they have given me a completely different perspective on everything I do.

"It has been the most inspiring and humbling experience to learn from them."



[Access for free at bit.ly/interact-ABI-lity](https://bit.ly/interact-ABI-lity)



## MANAGING THE FINAL WEEKS AND MONTHS OF SOMEONE'S LIFE IS A COMPLEX AND CHALLENGING TASK. HOW CAN AGED CARE STAFF ACCESS THE BEST TRAINING AND INFORMATION WHEN THEY NEED IT?

Every death is different. The needs of every dying individual are as diverse as the needs of every individual in the rest of their lives.

So, providing for the needs of people in their last year of life can be a complex, challenging task for clinicians and aged care workers.

While some of those may be highly qualified and experienced registered nurses, others may be fresh to the sector and equipped with a basic certificate level qualification.

Add to that the fact that, for many of these primary care workers English may not be their first languages, and that they are typically responsible for 70 per cent of the care-load, and the need for skills training becomes obvious.

Professor Deborah Parker – a registered nurse with experience in aged care - heads a four-person team at the UTS School of Nursing and Midwifery that develops toolkits for the aged care sector.

Their work is part of End of Life Directions for Aged Care (ELDAC), a national specialist palliative care and advance care planning advisory project, that is a collaboration between three universities and industry peak bodies in palliative care, aged care and healthcare providers. ELDAC is funded by the Australian Government Department of Health.

It supports the \$21bn spent on the sector every year by the Federal Government.

“We say end of life is the last 12 months of life, but it also includes the last days and weeks of life,” Professor Parker said.



*Professor Deborah Parker*

## What is the ELDAC Care Model?

The eight-stage model will help aged care staff determine:

- whether a person is approaching the end of their life
- how to plan and deliver care for a person
- how a person's care needs might change over time
- what resources would be useful for you in providing care
- whether you have education or learning needs

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**The Residential Aged Care and Home Care toolkits are both divided into three main sections:**

- Clinical Care
- Education and Learning
- Organisational Support

“We don’t want to teach people just for those last couple of days.

“We want to teach people to recognise the changes in people well in advance.”

Professor Parker developed The Palliative Approach Toolkit in 2011, the research group has now replaced that with the Residential Aged Care and Home Care Toolkits that form part of the ELDAC National Project.

“These toolkits are mechanisms for staff to really understand how to prepare for caring for people in their last 12 months of life,” Professor Parker said.

“They also help staff care for the families through the last months of life, and beyond into bereavement.

“These are evidence-based tools that we know work. We want staff to know where to go to get that information.”



The Residential Aged Care and Home Care toolkits are both divided into three main sections:

- Clinical Care
- Education and Learning
- Organisational Support

Each section has resources including a suite of videos designed to deliver the most up-to-date, evidence-based skills in a format that is as accessible as possible.

“The most inspiring part of this project for me is knowing that it’s so difficult as a frontline clinician to have up to date information that is easy to digest,” Professor Parker said.

“We have packaged information as clearly as we can so if you are looking after someone in pain, or in distress – example – there are tools that can make a real impact on a person’s quality of life.

“This is about trying to make life as easy as possible for clinicians, allied health workers and primary care workers.

“It’s also designed about making our final days as easy as possible for all Australians and their loved ones.”

## What are the stages?

### Advance Care Planning

Advance care planning is the process of planning for your current and future health care. It involves talking about your values, beliefs and preferences with your loved ones and doctors. This helps them make decisions about your care when you can't. People may also formalise their plan with an advance care directive.

### Recognise End-of-life

End of life is the period of time when the person is living with an irreversible condition and decline where death is foreseeable. Recognising when someone may be in the last months of life provides an opportunity for assessment of palliative care needs and palliative care planning.

### Assess palliative care needs

If someone has been recognised as being at the end of life, they should have a palliative care needs assessment. Re-assessment should occur regularly and at key transition points in the resident's trajectory.

### Provide palliative care

Palliative care addresses the physical social and spiritual needs of the older person. By providing palliative care for someone coming to the end of their life we can provide the best quality of life possible while managing symptoms and concerns.

### Work Together

Coordinating palliative care with other services helps us provide the best quality care. This can include the team in the aged care service, the GP, allied health providers or a palliative care service.

### Respond to deterioration

Over time there are likely to be changes in condition or additional symptoms and needs. As disease progresses, there is a need to identify and respond to deterioration to make sure the person continues to receive the best quality care.

### Manage dying

While individuals may differ in their signs and symptoms of dying there are some common indicators that a person may be in the final days of life. Some organisations have a specific care plan for residents in the final days or weeks of life.

### Bereavement, Grief and Loss

An older person may grieve due to a decline in physical, mental or cognitive health. It is also important to acknowledge that family may grieve before the death and may find bereavement difficult.



## TYPE 2 DIABETES IS THE MOST PREVALENT CHRONIC DISEASE IN AUSTRALIA. WHILST PREVENTABLE, IT HAS BEEN SEEN AS IRREVERSIBLE AND TREATMENT HAS FOCUSED ON MEDICATIONS. RAY KELLY IS DETERMINED TO CHANGE ALL THAT.

It's not every doctoral student who gets to co-host a three-part television series with Dr Michael Mosley, the creator of the 5:2 diet.

It's not every doctoral student who is instrumental in changing policy on single most prevalent chronic disease in Australia.

But then, Ray Kelly is not like every other PhD student.

The Kamilaroi man grew up in Mt Druitt, Western Sydney in poverty, and left school in Year 10.

Diabetes hit home from birth, with the death of his grandfather from a heart attack aged 52. Ray – now 52 himself but in rude health – was just three weeks old.

His uncle died aged 44, a victim of heart disease.

### What is Type 2 diabetes?

Type 2 diabetes is caused by visceral fat around the organs, especially the pancreas and the liver. It is caused by high-calorie, processed foods and less movement so people are carrying more weight. First Nations people are especially susceptible due to their genetics. They will store that around their organs even with a low BMI.



“It was always front of mind, the issues around that,” Ray said.

After joining a gym gave his drifting life purpose, he started work as strength and conditioning coach with the Sydney Academy of Sport.

His academic career started relatively late with a Bachelor of Arts in Human Movement at UTS.

Always the maverick, he started funding himself to go to obesity conferences around the world, convinced that there was a better way to treat diabetes than through a cascade of drugs and insulin.

“Some people thought I was reckless and careless but it was all research based and the outcomes were phenomenal,” Ray said.

“The results were much better than you would see anywhere in the country.

“The programs we run in remote communities are better than just about anything in the city.”

The Too Deadly for Diabetes Program aims to promote good nutrition, physical activity, weight loss, and to lower blood glucose levels for Aboriginal people with diabetes in NSW.

The program runs over 10 weeks and participants are assisted with meal planning, an exercise program, education and motivation.

It has been delivered across regional NSW in Bourke, Brewarrina and Walgett, and has recently been launched in Coonamble and Dubbo.

“Within the first 14 days, many people will see dramatic changes to their blood sugar and blood pressure,” Ray said.

“People had previously been taught how to live with diabetes rather than turn it around.

“Doctors have medication to fall back on - blood pressure, cholesterol, insulin.

“Yet within 10 years, 50 per cent of the people with Type 2 diabetes will be on insulin.

“We have people diagnosed at aged 7 or 8, and a lot are in their 20 and 30s, it’s usually a downward spiral from there.”

The tragedy – according to Ray – is that what has become a major chronic disease worldwide is not only preventable, but it’s reversible.

The effects of the disease are both real and unpleasant – gangrene leads to amputations of toes, feet and even legs; high blood pressure; kidney failure leads to years of dialysis and death; heart disease and cardiac arrests; even failing sight and blindness.

The UTS PhD is the result of decades of frustration with the entrenched medical model, offering sufferers little hope of anything better than maintenance.

“Change is difficult because there are lot of people pushing in a certain way,” Ray said.

“In my PhD I’m doing a literature review, interviewing people whose lives have reversed Type 2 diabetes , and running an intervention and measuring the results.”

So when renowned television health expert, Dr Michael Mosley, was researching his latest SBS series – Australia’s Health Revolution – his producers contacted Ray.

They were interested in an interview, but were so impressed with his work that they ended up with a co-host.

The show demonstrates the extraordinary effects of a calorie-controlled diet on everybody’s health, but most urgently those who are either pre-diabetic or already living with the chronic disease.

The results need to be seen to be believed. The series is currently streaming on SBS On Demand.

“How many people doing a PhD get to do a TV show with Michael Mosley?” Ray said.

“I am a spiritual guy, and I believe that my path has been guided. This is what I was born to do.

“I’ve put in a lot of work already, but now it’s time for the big push.”



## Case study

In late 2020, the Too Deadly for Diabetes program started in Coonamble NSW (Pop. 2,700). The program was provided through the Coonamble Aboriginal Health Service. Ray provided training to the nurse and Aboriginal health worker, who then rolled out the 10-week program to the community. In the first eight months their patients lost a total of 922kg, with many patients achieving a reduction or removal of medications for Type 2 diabetes and/or hypertension. The average weight loss has been between 8-10kg per person and the average reduction in HbA1c has been 1.5%. At 11 months, the total is now 1,459kg. Neither the nurse or the Aboriginal health worker had never provided a lifestyle program before.

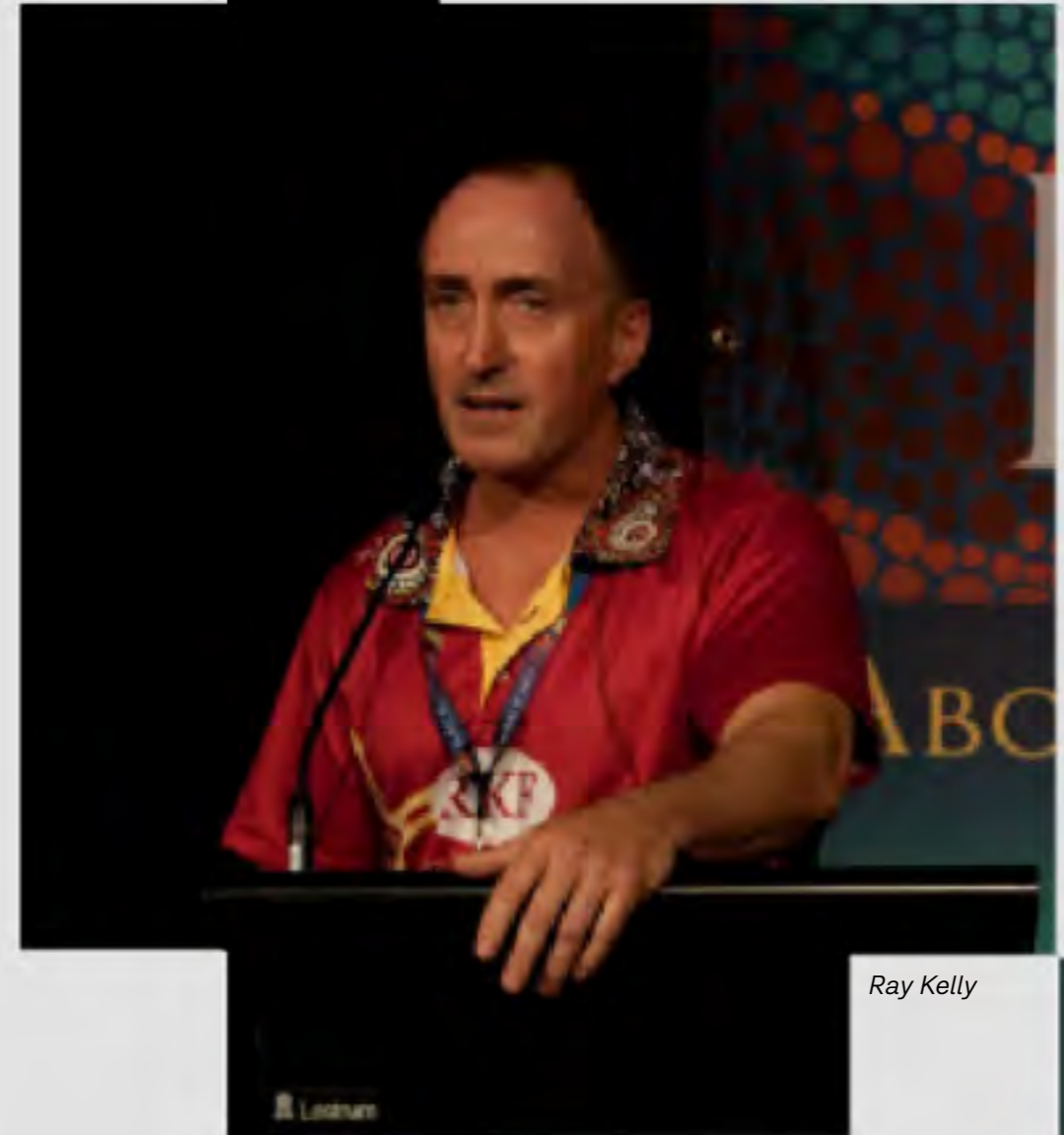
## Too Deadly For Diabetes – **the aims**

Whilst lowering average blood sugar is the primary goal, there are a range of other indicators of success:

- HbA1c <7% - Research has shown that current programs achieve this in less than 50% of patients. The program will aim to achieve this in at least 75% of patients.
- Weight loss of 5%-10% initial body weight
- Systolic blood pressure <140 and diastolic blood pressure <95
- Reduction in medications
- Education of patients to enhance self-management

## Too Deadly For Diabetes – **the method**

- Meal plans for healthy, cheap, low calorie food. Cost – around \$50 per week.
- Exercise program – starting with a 20-30 minute daily walk
- Education – including daily motivational videos delivered via an app and daily SMS messages.
- Patient contact and support – regular face-to-face meetings with health professionals.



Ray Kelly

STUDIES SHOW THAT IN THE GENERAL POPULATION THERE HAS BEEN A 40 PER CENT DECLINE IN EMPATHY LEVELS OVER THE LAST 30 YEARS. IN HEALTHCARE, DIMINISHED LEVELS OF EMPATHY CAN HAVE A SIGNIFICANT IMPACT ON PATIENTS' AND STAFF EMOTIONAL AND PHYSICAL WELLBEING.



Against this background the ['Empathy Initiative'](#) research group was formed in 2017.

"The aim of our research group is to conduct high quality, rigorous empathy and compassion research that informs and transforms student learning and patient care," Professor Tracy Levett-Jones, lead of the group and Professor of Nursing Education, from the UTS School of Nursing and Midwifery, said.

"Before the establishment of the Empathy Initiative, there were some academics in the school conducting empathy research.

"But we wanted to harness our collective strengths, collaborate and promote our research in ways that would impact both education and healthcare.

"Since 2017, our research has continued to expand and it is having a significant impact on students' and clinicians' empathy levels, both in Australia and internationally".

A few examples of our research are the work conducted by Dr Samantha Jakimowicz on intensive care nurses' compassion fatigue; Dr Fiona Orr's research on hearing distressing voices simulations; and Sue Dean's work on the impact of mindfulness on learners' empathy levels.



Professor Tracy Levett-Jones



Dr Samantha Jakimowicz

"What drives each of us, is the knowledge that empathic healthcare interactions can have a measurable impact on patient outcomes," Professor Levett-Jones said.

"We don't know the precise cause for this, but one hypothesis is that empathy reduces the stress response and cortisol production and therefore aids healing and promotes wellbeing."





## Empathy statistics

**52%** higher patient satisfaction with healthcare when clinicians demonstrate empathy

**93%** of patients believe that a lack of empathy lowers the quality of care

**1%** of patients describe their interactions with healthcare professionals as empathic encounters

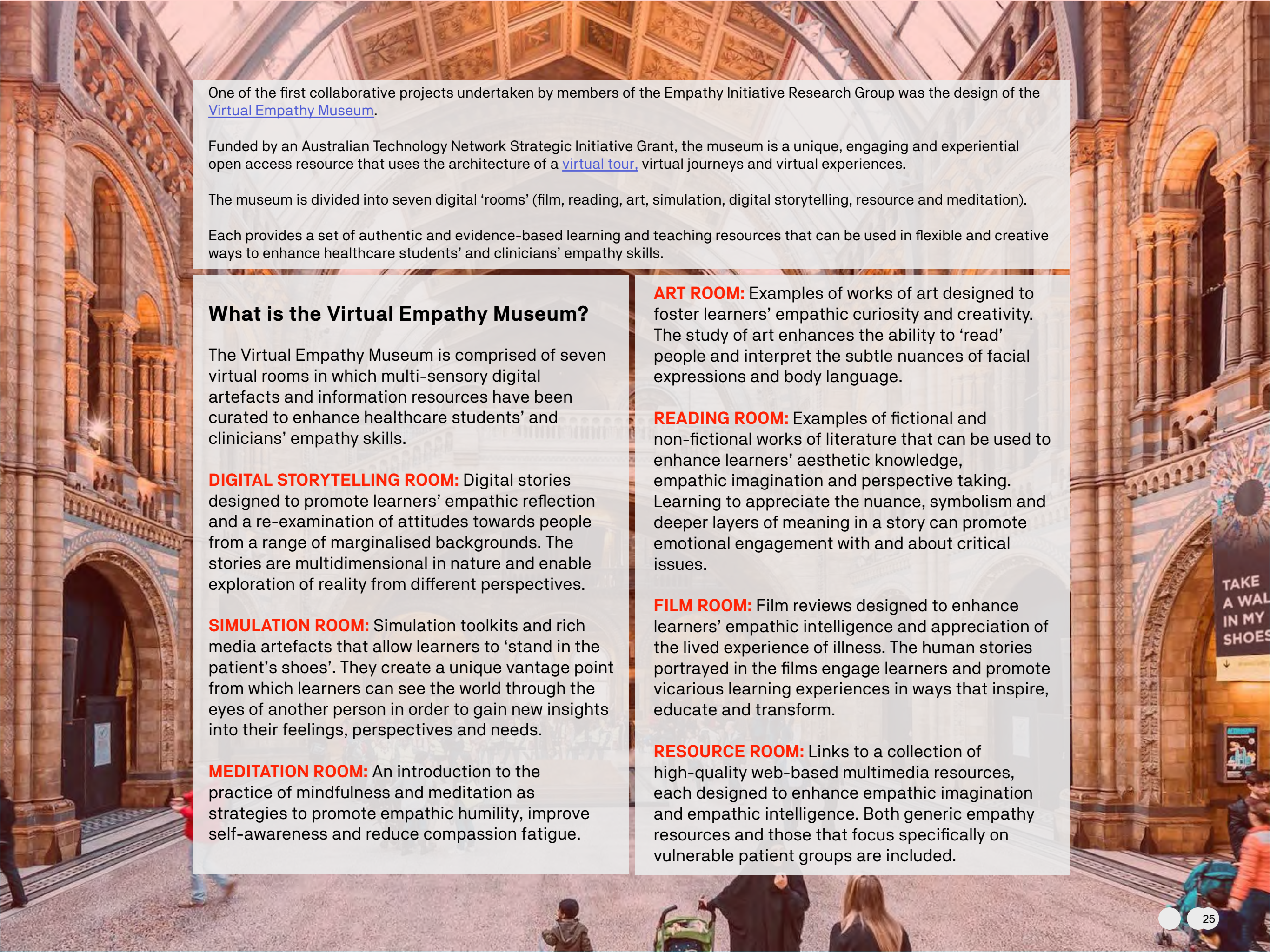
**50%** reduction in post-operative morphine requirements following an empathic pre-operative consultation

**50%** decline in nursing and medical students' empathy levels while enrolled in an undergraduate healthcare degree

**20%** reduction in pain, depression and anxiety when healthcare consultations convey empathy

**25%** higher levels of cellular immunity in patients with lung cancer when cared for by oncology nurses with high levels of empathy

**42%** reduction in emergency department visits from diabetic patients after empathetic interactions with doctors



One of the first collaborative projects undertaken by members of the Empathy Initiative Research Group was the design of the [Virtual Empathy Museum](#).

Funded by an Australian Technology Network Strategic Initiative Grant, the museum is a unique, engaging and experiential open access resource that uses the architecture of a [virtual tour](#), virtual journeys and virtual experiences.

The museum is divided into seven digital 'rooms' (film, reading, art, simulation, digital storytelling, resource and meditation).

Each provides a set of authentic and evidence-based learning and teaching resources that can be used in flexible and creative ways to enhance healthcare students' and clinicians' empathy skills.

## What is the Virtual Empathy Museum?

The Virtual Empathy Museum is comprised of seven virtual rooms in which multi-sensory digital artefacts and information resources have been curated to enhance healthcare students' and clinicians' empathy skills.

**DIGITAL STORYTELLING ROOM:** Digital stories designed to promote learners' empathic reflection and a re-examination of attitudes towards people from a range of marginalised backgrounds. The stories are multidimensional in nature and enable exploration of reality from different perspectives.

**SIMULATION ROOM:** Simulation toolkits and rich media artefacts that allow learners to 'stand in the patient's shoes'. They create a unique vantage point from which learners can see the world through the eyes of another person in order to gain new insights into their feelings, perspectives and needs.

**MEDITATION ROOM:** An introduction to the practice of mindfulness and meditation as strategies to promote empathic humility, improve self-awareness and reduce compassion fatigue.

**ART ROOM:** Examples of works of art designed to foster learners' empathic curiosity and creativity. The study of art enhances the ability to 'read' people and interpret the subtle nuances of facial expressions and body language.

**READING ROOM:** Examples of fictional and non-fictional works of literature that can be used to enhance learners' aesthetic knowledge, empathic imagination and perspective taking. Learning to appreciate the nuance, symbolism and deeper layers of meaning in a story can promote emotional engagement with and about critical issues.

**FILM ROOM:** Film reviews designed to enhance learners' empathic intelligence and appreciation of the lived experience of illness. The human stories portrayed in the films engage learners and promote vicarious learning experiences in ways that inspire, educate and transform.

**RESOURCE ROOM:** Links to a collection of high-quality web-based multimedia resources, each designed to enhance empathic imagination and empathic intelligence. Both generic empathy resources and those that focus specifically on vulnerable patient groups are included.

“Empathy is both a trait and a state,” Professor Levett-Jones said.

“Our research has demonstrated that state empathy can be taught through the arts and through experiential learning approaches such as simulation.

“For example, the immersive simulations in the Virtual Empathy Museum provide learners with an opportunity to ‘walk in the shoes’ of an older person, someone who hears distressing voices, a person who has had a stroke or is from a non-English speaking background.

“We have identified significant and long-lasting changes in learners’ empathy levels following exposure to these types of meaningful encounters.

“Our research projects often focus on marginalised and stigmatised groups – people who are homeless, refugees, those who have a mental illness, people with a disability or with alcohol and other drugs addictions, for example.

“These are the people who need empathic healthcare the most but are least likely to receive it.”

The Virtual Empathy Museum is used by individuals, universities and healthcare organisations across Australia and internationally.

It is constantly evolving, and current projects include the development of a series of new digital stories and animations and a systematic review examining the impact of curriculum co-design with lived experience experts on learners’ empathy levels.

The Empathy Initiative Research Group has grown from the initial seven members to 15 and continues to undertake collaborative projects focused on improving empathic patient care.

Professor Levett-Jones said the research was focused on outcomes, and designed to have a meaningful impact on clinical practice.

Because as Professor Jodi Halpern from UC Berkeley Public Health Faculty, advocates:

**“Empathy without action is not empathy.”**



# RESEARCHERS FROM THE CANCER SYMPTOM TRIALS GO WHERE OTHERS DO NOT. IN THE PROCESS, THEY CHANGE THE LIVES OF PEOPLE LIVING WITH CANCER FOR THE BETTER.



Sometimes, research needs to be done by universities because it's important for the public good – and because nobody else will do it.

Cancer Symptom Trials was established in 2017 to address the unmet symptom management needs of Australians living with cancer.

The program is building a comprehensive portfolio of clinical trials that will accelerate the improvement of cancer symptom management and quality of life for all people living with cancer.

“CST clinical trials often address research questions not supported by pharmaceutical industry but of utmost importance to people with cancer,” said CST chair, Professor Meera Agar.

“We do trials of drugs and interventions, led by academics and clinicians.”

Some of our trials evaluate “off-label prescribing”, where a medication is registered for use but for another population, formulation, or purpose – the role is to understand whether these interventions can be ‘re-purposed’ for a broader application.

Palliative care is an area where many drugs are used off label. This is combined with a reluctance by the pharmaceutical industry to fund trials, because palliative care –by its nature – is about managing symptoms, and not about finding a cure.

“Any drugs that have come off patent carry little commercial gain, so there is no incentive for pharmaceutical companies to do these trials,” Professor Agar said.

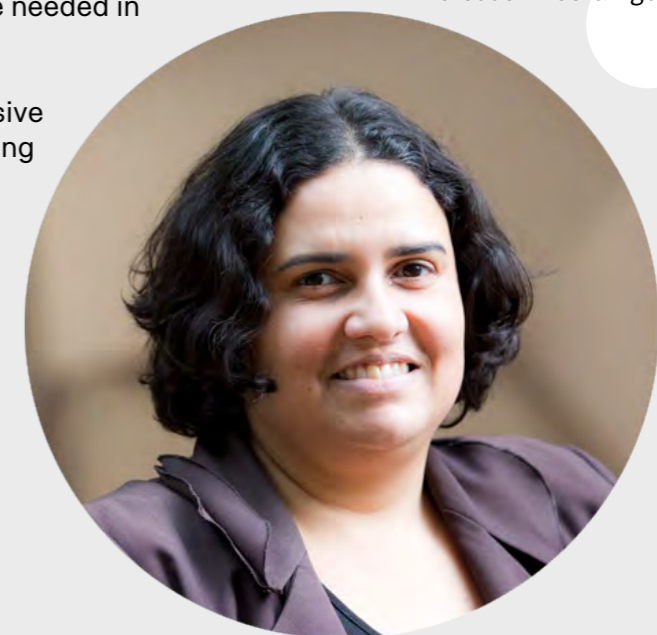
“We are one of the only groups looking to alleviate the symptoms, which people affected by cancer can sometimes experience for many years from diagnosis until remission or the end their life.”

Cancer Symptom Trials is a multidisciplinary research collaborative with more than 200 members working in research and health care organisations across Australia and worldwide.

They have expertise in clinical trial design, symptom interventions and supportive care, with a consumer advisory panel who help in prioritising research and ensuring that the studies are well-designed.

CST members are the driving force behind new study ideas and help identify key gaps and clinical challenges for which clinical trials will be needed in the future.

CST has a broad focus, inclusive of health interventions, training approaches as well as the evaluation of drug treatments.



Professor Meera Agar

## What works ...

Kapanol is an opioid that has been available for more than 20 years in Australia for reducing pain.

Thanks to UTS research it became the world's first approved treatment for chronic breathlessness.

People late in any life-limiting illness often start to lose muscle strength including the muscles that assist us to breathe comfortably. Feeling breathless is therefore a common symptom.

Kapanol is now routinely prescribed to alleviate this symptom.

## ... and what doesn't

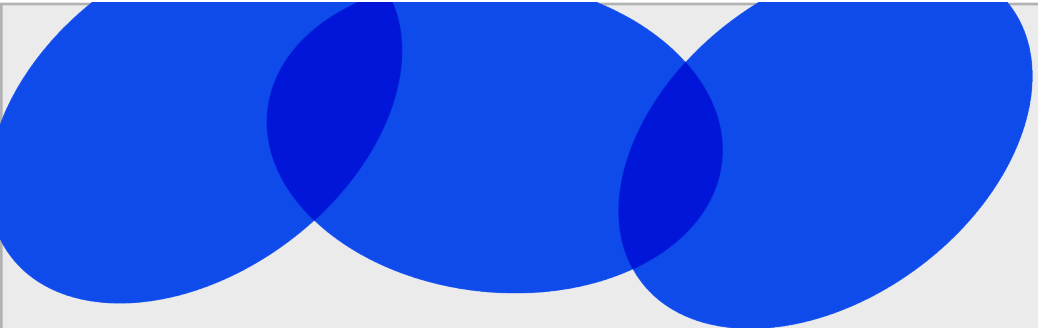
One in 10 people will experience delirium when taken to, or while in hospital care.

The eight-year study was the world-first trial of people with delirium in hospice and palliative care where delirium can be the hardest to treat.

They compared the antipsychotic medicines risperidone and haloperidol with a placebo, whilst optimising care through orientation, sleep, hydration and mobility.

The study found these commonly used medications led to worse symptoms.

The study instead recommended early diagnosis and non-medication based care.



The two critical research focus areas are:

Find better ways to manage symptoms that occur as a result of a cancer diagnosis or its treatments.

Improve the quality of life of people with cancer and their carers through prevention, early identification, assessment and treatment of symptoms.

The group is co-located with the Palliative Care Clinical Studies Collaborative, which started at Flinders University in 2006 and moved to UTS in 2017.

“The most important thing is that before we undertake the trial, we don’t know which treatment option is best,” said Professor Agar.

“Sometimes, our trials support our hypothesis and the new treatment is found to be effective, and this provides a strong argument to put forward for both registration and subsidy for this indication.”

Other times, the trials find that the study intervention has no benefit or worse, even causes harms.

“Our trial exploring antipsychotics for delirium is a good example of this,” Professor Agar said.

“While we recommended further research to find effective drug treatments, what we found was that the most effective treatments were about support.

“This could be regularly checking that patient hearing aids and glasses are worn, ensuring they are orientated to their environment, maintain hydration and optimal nutrition, and have regular sleeping patterns.”

It’s been a difficult year because most clinical trials in hospitals have paused and redirected to responding to the COVID-19 pandemic.

“Importantly, the needs of people with cancer continue, and CST has half a dozen trials waiting to reopen and hope to continue this important work from early next year,” Professor Agar said.

### Key symptoms for research

- Appetite and cachexia (chronic weight loss)
- Breathlessness
- Fatigue
- Pain
- Nausea
- Sleep
- Cognitive and neurological disorders
- Gut dysfunction



**MORE THAN 1 BILLION PEOPLE WORLDWIDE ARE IMPACTED BY DISEASES RELATED TO ABNORMAL BRAIN PRESSURE. DR MOJTABA GOLZAN AND HIS TEAM WANT TO SEE AN END OF DRILLING HOLES IN THE SKULL, WHEN A SIMPLE PHOTOGRAPH TAKEN ON A SMART PHONE WOULD SUFFICE.**

So here's what may happen – have a catheter inserted into your spine to relieve fluid, or have a hole drilled in your skull ... or have someone take a photo of your eye with a smart phone.

When Dr Mojtaba Golzan was researching his masters in his native Iran, he witnessed patients going into surgery to have a hole drilled into their skull.

“Just seeing the procedure of patients going into an operating theatre to have a catheter put in their brain was confronting,” Dr Golzan, Senior Research Fellow in the Faculty of Health, said.

Fast-track more than a decade and he's on the verge of developing a cheap, safe, non-invasive alternative.



*Dr Mojtaba Golzan*

A UTS cross-disciplinary team led by Dr Golzan has developed A-Eye, an all-in-one technology package that harnesses the power of artificial intelligence in combination with images obtained from the back of the eye; the natural window to the brain and eyes.

A-Eye improves the accuracy and reduces the invasiveness of the diagnostic procedure used to assess abnormal intra-cranial pressure. It won the first prize of \$30,000 in the UTS Research Translation Competition 2021.

There are a range of different diseases that are linked to intracranial pressure.


Abnormal pressure might be present in traumatic brain injury, stroke, a tumour, swelling or bleeding in the brain, meningitis or encephalitis.

### **Complications of existing procedures**

**18** per cent risk of procedural failure

**33** per cent risk of internal bleeding

**24** per cent risk of infection



A headache is sometime the only symptom of this dangerous, and potentially fatal condition if it doesn't receive immediate medical attention.

Time is of the essence.

The current problem is that all the procedures that measure an increase in pressure are invasive and uncertain.

The two procedures are a spinal tap or inserting a catheter through a hole in the skull.

"The procedures are painful, there is a risk of morbidity, internal bleeding, or a relatively common failure of the procedure," Dr Golzan said.

"Think of this as a very simple inhouse test before we put you through an MRI scan.


"It enables early diagnosis and this will lead to prompt medical intervention and will save lives as a result."

The other issue is that there are many parts of the world where more expensive diagnostic tools are simply unavailable.

A-Eye is both portable and relatively cheap.

Since 2016, Dr Golzan has worked in a four-person multidisciplinary team to develop a combination of hardware and artificial intelligence software that can measure increases in pressure simply by taking a photograph of the back of the eye.

Winning the Research Translation Competition will enable the team to develop the missing link, an app for a smartphone, that will capture the images and perform the analysis.



Next step will be testing by a number of Sydney clinics, followed by regulatory approvals, licensing and commercialisation.

Interest in the technology is already strong, with a grant from Google to develop the software component, and input from Rapido – the UTS Technology Development Unit – to develop the hardware component, an optical add-on to a smartphone.

The idea rests on the fact that any abnormal brain pressure can be measured from the area immediately at the back of the eye.

"The most exciting part of me is the improved outcome for patients," Dr Golzan said.

"Even if I could save one person going through an invasive process, I am happy with that."



## Symptoms of intra-cranial pressure

- Headache
- Blurred vision
- Confusion
- High blood pressure
- Shallow breathing
- Vomiting
- Changes in your behaviour
- Weakness or problems with moving or talking
- Lack of energy or sleepiness



# Find out more

**For more information about our research impact in the Faculty of Health or for collaboration opportunities, contact:**

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