Engineering the future of healthcare

ACMD

The Aikenhead Centre for Medical Discovery

It’s official… we’re going up!

2023 marks an exciting milestone for the Aikenhead Centre for Medical Discovery (ACMD). Construction of the 11-storey state-of-the-art research and teaching facility officially commenced in April.

Thank you sincerely for your contribution and support in making this a reality. As we look back at the achievements of the past 12 months, there is a palpable sense of excitement for what lies ahead.

The ACMD alliance of partners is already pushing the boundaries of biomedical engineering innovation. As the building takes shape, we are working busily behind the scenes to build the foundation and framework of our collaboration that will allow the ACMD to unfold its full impact.

Together, we will transform the future of healthcare. Thank you for joining us.

Construction has begun

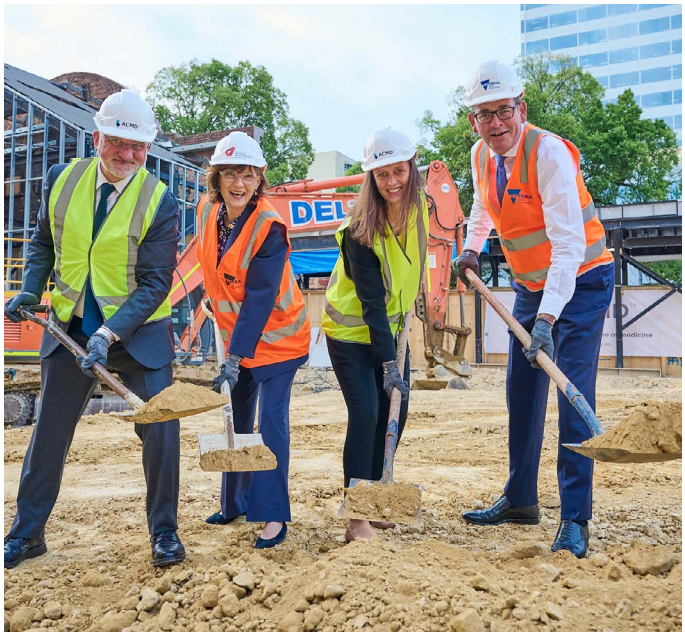
Construction of the $206 million ACMD has officially commenced..

Victorian Premier, Daniel Andrews, and Minister for Medical Research, Mary-Anne Thomas, visited the site at St Vincent’s Hospital to mark the start of construction.

Premier Andrews said, “Melbourne is the medical research capital of Australia – this new centre will cement our place as a world leader in medical discoveries and scientific breakthroughs.

The preliminary stage will involve piling works to allow the construction of the basement and foundations for the new building. The basement slab is scheduled to be poured in July.

Click here to read more.



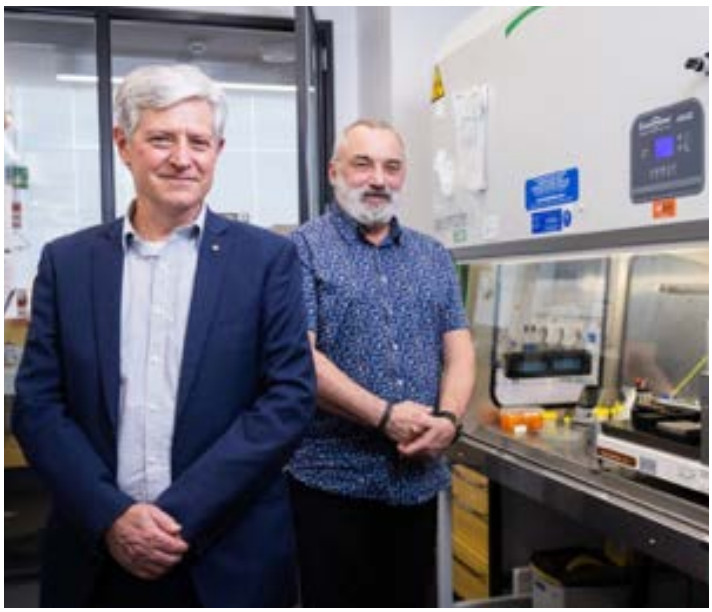
The project milestone gained strong interest from the Department of Health and the Premier’s Office. Premier Dan Andrews and the Hon. Mary-Anne Thomas (Minister for Health and Medical Research). Both attended and addressed the group following the formal ground-breaking. Their attendance reinforced messaging around the ACMD forming a key part in the Victorian Government’s 10-year plan for Melbourne’s new biomedical precinct.

Click here to read more.

The future of skin repair

Damage and loss of skin is a major challenge and a burden on health care. A globally innovative Aikenhead Centre for Medical Discovery (ACMD) research project is investigating the development of a process capable of producing a 3D printed material with similar properties to human skin for the treatment of cancer, trauma and burn victims.

Led by St Vincent's and RMIT University, in collaboration with the University of Melbourne, the project aims to create the core three layers of human skin into a novel synthetic tissue with the addition of the patient's own cells. This innovative technique is hoped to produce a biofabricated skin that will avoid rejection and rapidly repair wounds and minimise scarring.



Pictured: Associate Professor Chris Baker (L) and Professor Robert Kapsa at the ACMD BioFab lab

"It is hoped that biofabricated skin, when available, will improve the quality of life for patients with skin loss from trauma and chronic disease, with far more natural outcomes," said Associate Professor Chris Baker, Director of Dermatology at St Vincent's Hospital Melbourne, who is jointly leading the project with Robert Kapsa, Professor of Biofabrication and Tissue Engineering at RMIT University.

Click here to read more.

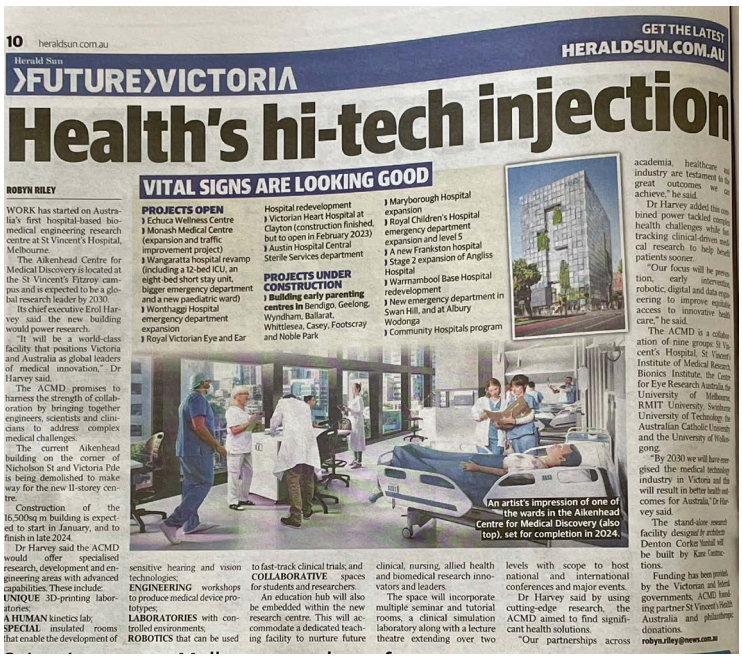
Click here If you would like to support the ACMD.

In the media

The ACMD gained strong media coverage in the Herald Sun with two articles included in a special series called Victoria First that highlighted ACMD as global leaders and innovators of medical research.

The first article was on ACMD and what it means to the future of healthcare. ACMD CEO, Dr Erol Harvey, was quoted extensively in the story that stated that Australia is on track to becoming a global biomedical engineering research leader and ACMD is leading the way.

Click Here For article link (Paywall)



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Herald Sun

FUTURE VICTORIA

Health's hi-tech injection

ROBYN RILEY

VITAL SIGNS ARE LOOKING GOOD

PROJECTS OPEN

- Echuca Wellness Centre
- Monash Medical Centre (expansion and traffic improvement project)
- Wangaratta hospital revamp (including a 12-bed ICU, an eight-bed short stay unit, bigger emergency department and a new paediatric ward)
- Wonthaggi Hospital emergency department expansion
- Royal Victorian Eye and Ear Hospital redevelopment
- Victorian Heart Hospital at Clayton (construction finished, but to open in February 2023)
- Austin Hospital Central Sterile Services department

PROJECTS UNDER CONSTRUCTION

- **Building early parenting centres in** Bendigo, Geelong, Wyndham, Ballarat, Whittlesea, Casey, Footscray and Noble Park
- Maryborough Hospital expansion
- Royal Children's Hospital emergency department expansion and level 5
- A new Frankston hospital
- Stage 2 expansion of Angliss Hospital
- Warrnambool Base Hospital redevelopment
- New emergency department in Swan Hill, and at Albury Wodonga
- Community Hospitals program

An artist's impression of one of the wards in the Aikenhead Centre for Medical Discovery (also top), set for completion in 2024.

WORK has started on Australia's first hospital-based biomedical engineering research centre at St Vincent's Hospital, Melbourne.

The Aikenhead Centre for Medical Discovery is located at the St Vincent's Fitzroy campus and is expected to be a global research leader by 2030.

Its chief executive Erol Harvey said the new building would power research.

"It will be a world-class facility that positions Victoria and Australia as global leaders of medical innovation," Dr Harvey said.

The ACMD promises to harness the strength of collaboration by bringing together engineers, scientists and clinicians to address complex medical challenges.

The current Aikenhead building on the corner of Nicholson St and Victoria Pde is being demolished to make way for the new 11-storey centre.

Construction of the 16,500sq m building is expected to start in January, and to finish in late 2024.

Dr Harvey said the ACMD would offer specialised research, development and engineering areas with advanced capabilities. These include:

UNIQUE 3D-printing laboratories;

A HUMAN kinetics lab;

SPECIAL insulated rooms that enable the development of sensitive hearing and vision technologies;

ENGINEERING workshops to produce medical device prototypes;

LABORATORIES with controlled environments;

ROBOTICS that can be used to fast-track clinical trials; and

COLLABORATIVE spaces for students and researchers.

An education hub will also be embedded within the new research centre. This will accommodate a dedicated teaching facility to nurture future clinical, nursing, allied health and biomedical research innovators and leaders.

The space will incorporate multiple seminar and tutorial rooms, a clinical simulation laboratory along with a lecture theatre extending over two levels with scope to host national and international conferences and major events.

Dr Harvey said by using cutting-edge research, the ACMD aimed to find significant health solutions.

"Our partnerships across academia, healthcare and industry are testament to the great outcomes we can achieve," he said.

Dr Harvey added this combined power tackled complex health challenges while fast-tracking clinical-driven medical research to help better patients sooner.

"Our focus will be precision, early intervention, robotic, digital and data engineering to improve equitable access to innovative healthcare," he said.

The ACMD is a collaboration of nine groups: St Vincent's Hospital, St Vincent's Institute of Medical Research, Bionics Institute, the Centre for Eye Research Australia, the University of Melbourne, RMIT University, Swinburne University of Technology, the Australian Catholic University and the University of Wollongong.

"By 2030 we will have energised the medical technology industry in Victoria and this will result in better health outcomes for Australia," Dr Harvey said.

The stand-alone research facility designed by architect Denton Corker Marshall will be built by Kane Constructions.

Funding has been provided by the Victorian and federal governments, ACMD founding partner St Vincent's Health Australia and philanthropic donations.

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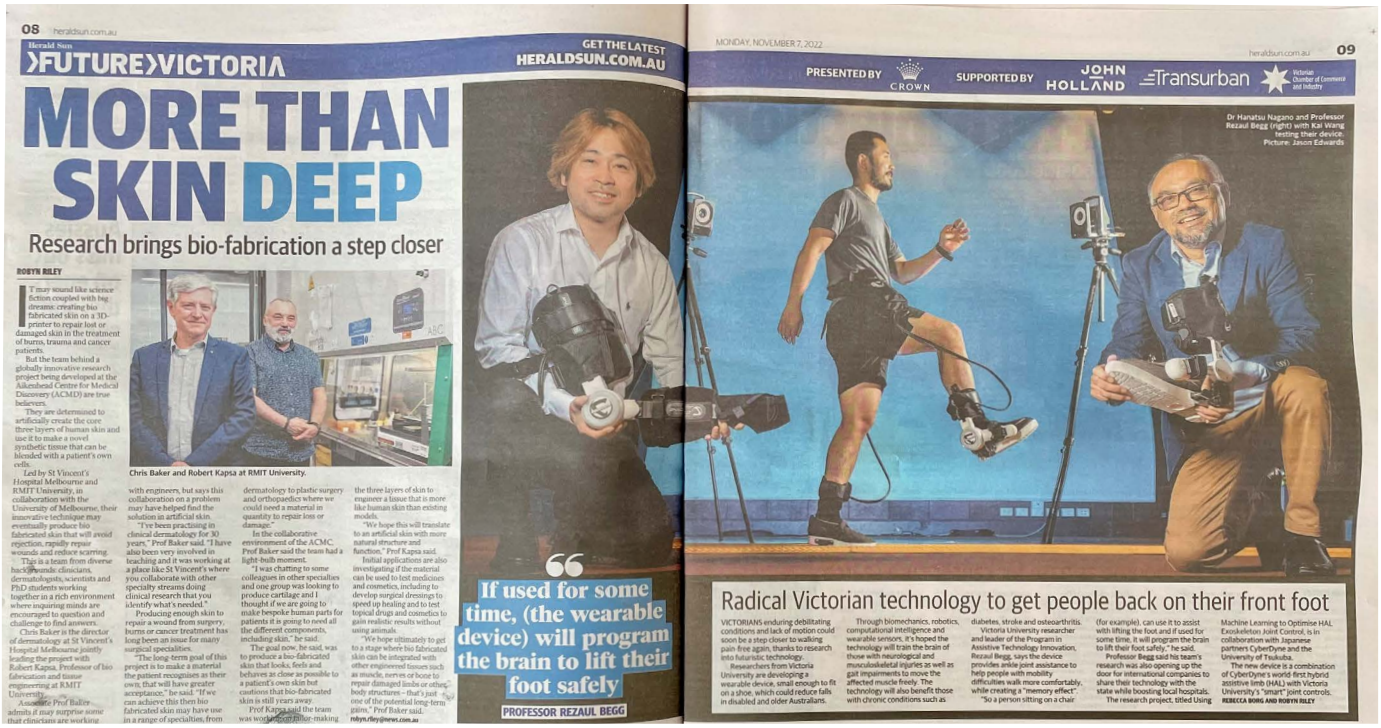
The second article featured a story on the artificial skin project as part of the Victoria First series. It called the project 'globally innovative' and radical technology that may transform Victorian healthcare.

Click Here For article link (Paywall)



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Herald Sun

FUTURE VICTORIA

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MORE THAN SKIN DEEP

Research brings bio-fabrication a step closer

ROBYN RILEY

IT may sound like science fiction, coupled with big dreams: creating bio fabricated skin on a 3D-printer to repair lost or damaged skin in the treatment of burns, trauma and cancer patients.

But the team behind a globally innovative research project being developed at the Aikenhead Centre for Medical Discovery (ACMD) are true believers.

They are determined to artificially create the core three layers of human skin and use it to make a novel synthetic tissue that can be blended with a patient's own cells.

Led by St Vincent's Hospital Melbourne and RMIT University, in collaboration with the University of Melbourne, their innovative technique may eventually produce bio fabricated skin that will avoid rejection, rapidly repair wounds and reduce scarring.

The is a team from diverse backgrounds: clinicians, dermatologists, scientists and PhD students working together in a rich environment where inquiring minds are encouraged to question and challenge to find answers.

Chris Baker is the director of dermatology at St Vincent's Hospital Melbourne jointly leading the project with Robert Kapsa, Professor of bio fabrication and tissue engineering at RMIT University.

Associate Prof Baker admits it may surprise some that clinicians are working with engineers, but says this collaboration on a problem may have helped find the solution in artificial skin.

"I've been practising in clinical dermatology for 30 years," Prof Baker said. "I have also been very involved in teaching and it was working at a place like St Vincent's where you collaborate with other specialty streams doing clinical research that you identify what's needed."

Producing enough skin to repair a wound from surgery, burns or cancer treatment has long been an issue for many surgical specialties.

"The long-term goal of this project is to make a material the patient recognises as their own, that will have greater acceptance," he said. "If we can achieve this then bio fabricated skin may have use in a range of specialties, from dermatology to plastic surgery and orthopaedics where we could need a material in quantity to repair loss or damage."

In the collaborative environment of the ACMC Prof Baker said the team had a light-bulb moment.

"I was chatting to some colleagues in other specialties and one group was looking to produce cartilage and I thought if we are going to make bespoke human parts for patients it is going to need all the different components, including skin," he said.

The goal now, he said, was to produce a bio-fabricated skin that looks, feels and behaves as close as possible to a patient's own skin but cautions that bio-fabricated skin is still years away.

Prof Kapsa said the team was working on tailor-making the three layers of skin to engineer a tissue that is more like human skin than existing models.

"We hope this will translate to an artificial skin with more natural structure and function," Prof Kapsa said.

Initial applications are also investigating if the material can be used to test medicines and cosmetics, including to develop surgical dressings to speed up healing and to test topical drugs and cosmetics to gain realistic results without using animals.

"We hope ultimately to get to a stage where bio fabricated skin can be integrated with other engineered tissues such as muscle, nerves or bone to repair damaged limbs or other body structures – that's just one of the potential long-term gains," Prof Baker said.

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Chris Baker and Robert Kapsa at RMIT University.

"If used for some time, (the wearable device) will program the brain to lift their foot safely"

PROFESSOR REZAUL BEGG

MONDAY, NOVEMBER 7, 2022 heraldsun.com.au 09

PRESENTED BY CROWN SUPPORTED BY JOHN HOLLAND Transurban Victorian Chamber of Commerce and Industry

Dr Hanatsu Nagano and Professor Rezaul Begg (right) with Kai Wang testing their device. Picture: Jason Edwards

Radical Victorian technology to get people back on their front foot

VICTORIANS enduring debilitating conditions and lack of motion could soon be a step closer to walking pain-free again, thanks to research into futuristic technology.

Researchers from Victoria University are developing a wearable device, small enough to fit on a shoe, which could reduce falls in disabled and older Australians.

Through biomechanics, robotics, computational intelligence and wearable sensors, it's hoped the technology will train the brain of those with neurological and musculoskeletal injuries as well as gait impairments to move the affected muscle freely. The technology will also benefit those with chronic conditions such as diabetes, stroke and osteoarthritis.

Victoria University researcher and leader of the Program in Assistive Technology Innovation, Rezaul Begg, says the device provides ankle joint assistance to help people with mobility difficulties walk more comfortably, while creating a "memory effect".

"So a person sitting on a chair (for example), can use it to assist with lifting the foot and if used for some time, it will program the brain to lift their foot safely," he said.

Professor Begg said his team's research was also opening up the door for international companies to share their technology with the state while boosting local hospitals.

The research project, titled Using Machine Learning to Optimise HAL Exoskeleton Joint Control, is in collaboration with Japanese partners CyberDyne and the University of Tsukuba.

The new device is a combination of CyberDyne's world-first hybrid assistive limb (HAL) with Victoria University's "smart" joint controls.

REBECCA BORG AND ROBYN RILEY

ACMD welcomes international research collaboration

A key focus of work at the ACMD is to harness the power of collaboration in biomedical engineering research to solve some of today's biggest health challenges. Collaboration can be far reaching. We were delighted to host visiting Professor, Sara Ramos Romero, from The University of Barcelona.

Professor Sara Ramos Romero, a physiologist from the University of Barcelona, participated in a four-month international partnership experience that enabled her to work at the ACMD BioFab lab alongside our local researchers.

During her visit, Professor Ramos Romero (pictured) contributed to a tissue engineering project that is investigating the use of stem cells and biomaterial technology to potentially repair cartilage injuries and treat osteoarthritis.

ACMD CEO, Dr Erol Harvey, is a strong advocate for international collaborations, adding they bring a fresh perspective to problem solving.

Click here to read more.

Supporters make a tangible impact

Left to right: Generous ACMD donors, Paul Cross, Barry Janes and ACMD CEO, Erol Harvey

Two leading Melbourne philanthropists, Barry Janes and Paul Cross, have donated $150,000 to the ACMD.

The pair were keen to support the development of hearing and vision technology so they opted for their generous donation to go towards three Faraday rooms. These specially insulated rooms enable the development of sensitive hearing and vision technologies.

They will form part of the new ACMD building currently under construction at St Vincent's Hospital Melbourne.

"The devices being developed aim to improve patients' quality of life. There are so many opportunities to harness AI to speed up diagnostics and enhance medical technology and we are very excited about the potential.

"Leaving a legacy while you're still alive, instead of waiting until you're gone, means you get so much back personally. Seeing the benefits and witnessing the impact is a wonderful feeling," Barry said.

Click here to read more.

Click here If you would like to support the ACMD.

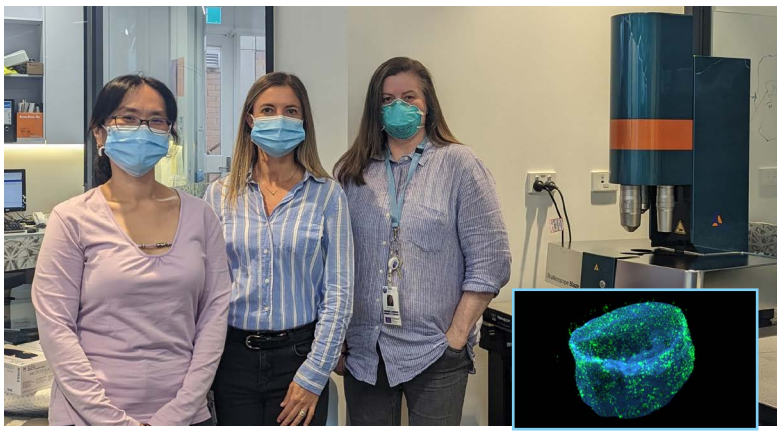
The Ian Potter Foundation funds state-of-the-art microscope

An innovative new 3D microscope is changing the way research teams at the ACMD approach investigations into treatments for various disorders including epilepsy, muscle diseases and the prevention of osteoarthritis.

The first model of its kind in Australia, the UltraMicroscope Blaze Light Sheet microscope, has the ability to provide never before seen three-dimensional (3D) detail of fully-intact tissue and organ samples, enabling researchers to gain an entirely new perspective.

This state-of-the art microscope was made possible thanks to a generous grant of $100,000 from The Ian Potter Foundation.

Click here to read more.



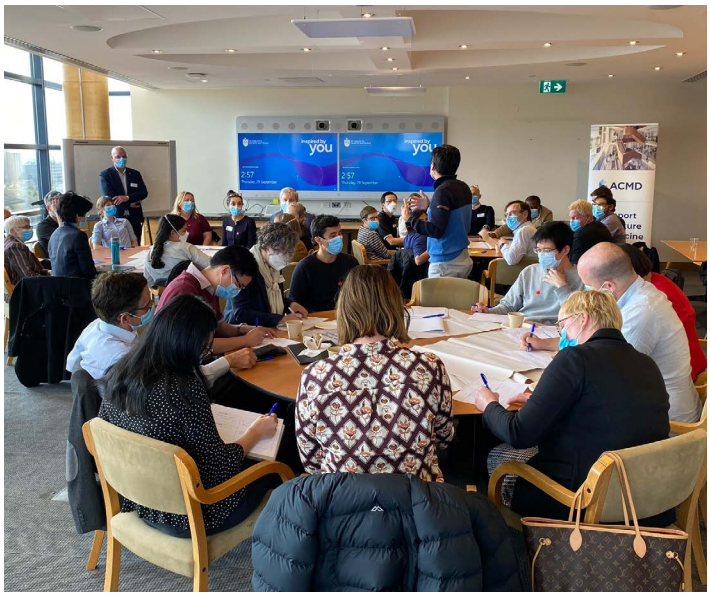
L to R: ACMD researchers, Dr Cynthia Wong, Dr Serena Duchi and A/Prof Anita Quigley with the UltraMicroscope Blaze Light Sheet microscope

Dedicated workshops to address clinical problems

The ACMD Challenge program launched in 2022 thanks to the support of the Australian Medtech Manufacturing Centre – a Victorian Government initiative.

ACMD Challenge identifies projects addressing a clinical problem where medical technologies might provide a solution. Each project must have a clear community or commercial translation pathway that can be enhanced through medical technology. From there, we work with project champions to bring together multi-disciplinary teams to work on the project.

ACMD Challenge rolls out in three stages: A Seminar, Workshop and Advance.

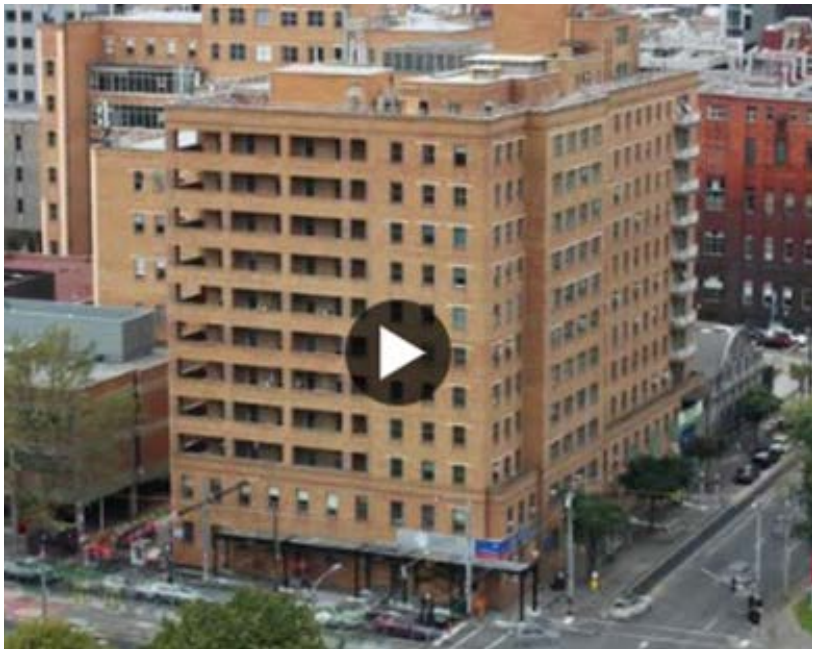


The topics covered by ACMD Challenge to date are:

- Falls Prevention in Hospitals
- Bowel Cancer Screening
- Lymphoedema uncovered

Click here to read more.

Demolition in action



Aikenhead Wing demolition at St Vincents Hospital Melbourne

Here's an exciting look back at a key project milestone with this amazing time-lapse vision of the demolition captured by Kane Constructions Pty Ltd, ACMD's official builder.

At the ACMD, we have the breadth of capabilities to tackle hard-to-solve clinical problems and bring medical solutions from bench to bedside.

But we cannot do it alone.

It is your support that allows us to realise our vision and keep lifting our ambition.

Thank you again for your contribution.

To find out more about this exciting project and how you can be involved please contact:

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SVI St Vincent's Institute Medical Research

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