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SYDNEY

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**Westmead Applied
Research Centre**

Westmead Applied Research Centre: Featured publications for 2021



Featured publications for 2021

Sex Disparities in Myocardial Infarction: Biology or Bias?

Stehli J, Duffy SJ, Burgess S, Kuhn L, Gulati M, **Chow C, Zaman S**. *Heart Lung Circ*. 2021 Jan;30(1):18-26. doi: [10.1016/j.hlc.2020.06.025](https://doi.org/10.1016/j.hlc.2020.06.025)

This study, which was one of Heart Lung and Circulation's top 10 most downloaded papers for 2021, examined how differences in the presentation, diagnosis, and treatment for acute myocardial infarction (MI) between men and women result in poorer outcomes for women. Awareness of women's risk of cardiovascular disease, women-specific cardiovascular research and guidelines for diagnosis and treatment of women patients were highlighted as challenges that need to be addressed to improve MI outcomes for women.

The Impact of Frailty on the Effectiveness and Safety of Intensive Glucose Control and Blood Pressure-Lowering Therapy for People With Type 2 Diabetes: Results From the ADVANCE Trial

Nguyen TN, Harris K, Woodward M, Chalmers J, Cooper M, Hamet P, Harrap S, Heller S, MacMahon S, Mancia G, Marre M, Poulter N, Rogers A, Williams B, Zoungas S, Chow CK, Lindley RI. *Diabetes Care*. 2021 May 25;dc202664. doi: [10.2337/dc20-2664](https://doi.org/10.2337/dc20-2664)

Published in Diabetes Care, the top journal in diabetes, this study aimed to investigate diabetes treatment outcomes in frail individuals. The analysis showed that participants with frailty had reduced benefits from blood pressure and intensive glucose treatment and highlighted the importance of routine clinical assessment of frailty in personalising treatment for older people.



Global and national high blood pressure burden and control

Nguyen TN, Chow CK. *Lancet*. 2021 Sep 11;398(10304):932-933. doi: [10.1016/S0140-6736\(21\)01688-3](https://doi.org/10.1016/S0140-6736(21)01688-3)

Hypertension is a risk factor for cardiovascular disease and other chronic health conditions. Globally, blood pressure control is still a major issue, with global control rates of only approximately 20%. This invited commentary highlights the urgent need for a transformation and innovative approaches to reduce the burden of hypertension worldwide.



Initial treatment with a single pill containing quadruple combination of quarter doses of blood pressure medicines versus standard dose monotherapy in patients with hypertension (QUARTET): a phase 3, randomised, double-blind, active-controlled trial

Chow CK, Atkins ER, Hillis GS, Nelson MR, Reid CM, Schlaich MP, Hay P, Rogers K, Billot L, Burke M, Chalmers J, Neal B, Patel A, Usherwood T, Webster R, Rodgers A; QUARTET Investigators. *Lancet*. 2021 Aug 27;S0140-6736(21)01922-X. doi: [10.1016/s0140-6736\(21\)01922-x](https://doi.org/10.1016/s0140-6736(21)01922-x)

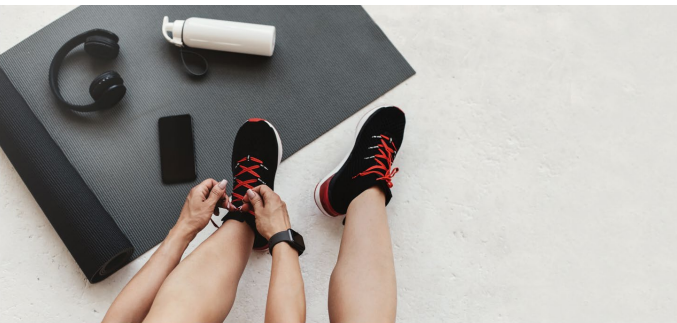
This first large-scale, long-term trial of a new strategy using combinations of 4 very low-dose blood pressure-lowering medications in a single capsule, demonstrated significantly improved control of high blood pressure – the leading cause of heart attack and stroke. The novel therapy brought blood pressure under control in 80 percent of participants in 12 weeks, compared to 60 percent in the control group who nonetheless had access to the best patient care. This study was presented at the world-leading European Society of Cardiology conference, ESC Congress 2021.

Do smartphone applications and activity trackers increase physical activity in adults? Systematic review, meta-analysis and meta-regression

Laranjo L, Ding D, Heleno B, Kocaballi B, Quiroz JC, Tong HL, Chahwan B, Neves AL, Gabarron E, Dao KP, Rodrigues D, Neves GC, Antunes ML, Coiera E, Bates DW. *Br J Sports Med.* 2021 Apr;55(8):422-432.

doi: [10.1136/bjsports-2020-102892](https://doi.org/10.1136/bjsports-2020-102892)

Smartphone applications and activity trackers are now used by millions of people worldwide. This study showed that apps and trackers significantly increase physical activity, particularly when providing personalised support and using text-message reminders.



Clinical and Electrophysiological Characteristics of Ventricular Tachycardias From the Basal Septum in Structural Heart Disease

Kotake Y, Campbell T, Bennett RG, Turnbull S, Huang K, Ross N, Trivic I, De Silva K, Bhaskaran A, Kumar S. *JACC Clin Electrophysiol.* 2021 Oct;7(10):1274-1284.

doi: [10.1016/j.jacep.2021.06.001](https://doi.org/10.1016/j.jacep.2021.06.001)

This study demonstrated that basal-septal ventricular tachycardias (VTs) in patients with SHD have a distinct clinical, electrocardiographic, and electrophysiological profile which can be identified using electrocardiography. Furthermore, basal-septal VTs were shown to be accompanied by a deep intramural septal substrate that limit the success of catheter ablation as a treatment.

Clinician-Created Educational Video Resources for Shared Decision-making in the Outpatient Management of Chronic Disease: Development and Evaluation Study

Kovoor JG, McIntyre D, Chik WWB, Chow CK, Thiagalingam A. *J Med Internet Res.* 2021 Oct 11;23(10):e26732.

doi: [10.2196/26732](https://doi.org/10.2196/26732)

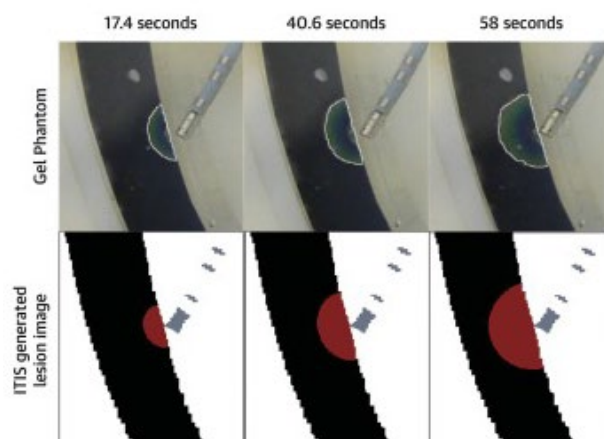
This study evaluated the utility of a short clinician-created patient education module designed to be shown in the waiting room. Over 90% of the patients enrolled reported satisfaction with the educational videos, as well as improvements in decision-making ability, consultation anxiety and treatment adherence.

Optimizing Impedance Change Measurement During Radiofrequency Ablation Enables More Accurate Characterization of Lesion Formation

Qian PC, Nguyen DM, Barry MA, Tran V, Lu J, Thiagalingam A, Thomas SP, McEwan A. *JACC Clin Electrophysiol.* 2021 Apr;7(4):471-481.

doi: [10.1016/j.jacep.2020.09.011](https://doi.org/10.1016/j.jacep.2020.09.011)

Catheter ablation is now widely used for treatment of many heart rhythm disorders. Our team is developing a new medical device for monitoring the amount of heating to heart tissue to improve the safety and efficacy of this procedure. This paper describes the principle by which our novel measurement method leverages the changes in electrical properties of heart tissues to detect heating during catheter ablation.



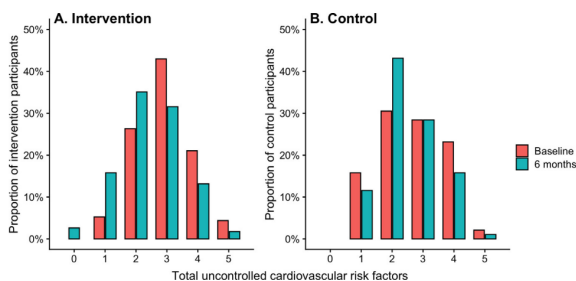
Featured PhD publications for 2021

Text messages for primary prevention of cardiovascular disease: The TextMe2 randomized clinical trial

Klimis H, Thiagalingam A, McIntyre D, Marschner S, Von Huben A, Chow CK. *Am Heart J.* 2021 Aug 21;242:33-44.

doi: [10.1016/j.ahj.2021.08.009](https://doi.org/10.1016/j.ahj.2021.08.009)

This randomised clinical trial assessed the impact of a 6-month SMS support program (TextMe2) in improving control of cardiovascular risk factors in adults without heart disease but at high risk. TextMe2 motivated behaviour change, reduced physical inactivity, and improved risk factor control overall. However, the proportion of participants with at least 3 uncontrolled risk factors at 6 months was not different between those who received texts and those who didn't.



Catheter Ablation of Ventricular Tachycardia Guided by Substrate Electrical Inexcitability

Bennett R, Campbell T, De Silva K, Bhaskaran A, Kumar S. *Circ Arrhythm Electrophysiol.* 2021 Mar;14(3):e009408.

doi: [10.1161/circep.120.009408](https://doi.org/10.1161/circep.120.009408)

This study examined the use of ventricular substrate mapping and high-output pacing to guide catheter ablation procedures in ventricular tachycardia patients by identifying areas of electrical inexcitability (EI). EI-guided catheter ablation was shown to improve ventricular arrhythmia-free survival and survival free from recurrent ventricular tachycardia storm compared to standard catheter ablation over 12 months.

Education on cardiac risk and CPR in cardiology clinic waiting rooms: a randomised clinical trial

McIntyre D, Thiagalingam A, Klimis H, Von Huben A, Marschner S, Chow CK. *Heart.* 2021 Jul 21;heartjnl-2021-319290.

doi: [10.1136/heartjnl-2021-319290](https://doi.org/10.1136/heartjnl-2021-319290)

The time patients spend waiting for healthcare is often wasted. In this study of over 300 patients in outpatient cardiology clinics, our team found that those offered customised, video-based education on heart disease risk factors and CPR in the waiting room were more motivated to improve their cardiac health, more confident to perform CPR and more satisfied with their overall clinical care.

User Perceptions and Experiences of a Handheld 12-Lead Electrocardiographic Device in a Clinical Setting: Usability Evaluation

Wong KC, Thiagalingam A, Kumar S, Marschner S, Kunwar R, Bailey J, Kok C, Usherwood T, Chow CK. *JMIR Cardio.* 2021 Aug 26;5(2):e21186.

doi: [10.2196/21186](https://doi.org/10.2196/21186)

It is important to evaluate usability of medical devices involving end-users in a real-world clinical setting. This Industry Partnership project established a framework to assess the device reliability, user acceptability and characterisation of time efficiency of a handheld 12-lead ECG at Westmead Hospital.

