Alfred Research Alliance

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Alfred Health Research Week 2025

Alfred Research Alliance Scientific Abstracts 2025

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2025

Scientific Abstract Competition Winners

Winner

Alfred Research Alliance Aboriginal and Torres Strait Islander Peoples' Research

Identifying The Characteristics of an Acceptable, Appropriate, and Culturally Safe Needle and Syringe Program for Aboriginal and Torres Strait Islander Populations in Australia: A Scoping Review

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[1]Burnet Institute; [2]Hepatitis Services, The Alfred; [3]Department of Epidemiology and Preventive Medicine, Monash University; [4]Doherty Institute and School of Population and Global Health, University of Melbourne.

Background: Hepatitis C is a blood-borne viral infection, commonly linked to sharing injecting equipment among people who inject drugs (PWID). Despite widespread provision of harm reduction services including needle and syringe programs (NSP), rates of hepatitis C continue to remain high among First Nations populations in Australia. As First Nations peoples are overrepresented in populations of PWID and have higher rates of risky injecting practices, implementing harm reduction strategies specifically targeting First Nations peoples is a priority for hepatitis C elimination efforts.

Aims:

1. Identify drivers of risky injecting behaviours among First Nations PWID

2. Examine what is known about making harm reduction services culturally safe and appropriate

3. Make recommendations for designing NSPs for First Nations PWID

Methods: Following the Joanna Briggs Institute Scoping Review Methodology, we searched for relevant published literature (MEDLINE and PsycINFO), grey literature and supplemented with relevant news articles to provide context to the societal and community landscape. Citation searching was used to identify additional studies and reports.

Results: Risky injecting behaviours were influenced by overlapping factors: high incarceration rates where unsafe injecting practices are introduced; stigma and discrimination causing psychological distress and risky practices; lower health literacy around blood borne virus transmission and safe injecting. Young people and women were highlighted as particularly at-risk.

Barriers to use of existing NSP services include issues around accessibility (location, transport), acceptability (security, discrimination), awareness, and appropriateness (amount/ type of equipment obtainable). Enablers include addressing these barriers, incorporating a holistic approach supporting the family and community of PWID, and addressing prevailing abstinence-only ideologies in many communities.

Conclusion: This review highlights key features of culturally safe and acceptable NSPs for First Nations peoples. The findings provide an evidence base for designing comprehensive harm reduction services that meet the needs of First Nations PWID, their families, and communities.

Winner

Alfred Research Alliance - Consumer Involvement in Research

A mixed methods study to identify Australia's top 10 research priorities for perioperative medicine. Short title: Perioperative Medicine Research Priorities in Australia

Sophie K. A. Wallace, Tracey K. Bucknall, Andrew Forbes and Paul S. Myles,

Perioperative medicine plays a critical role in improving surgical outcomes, yet research efforts are often fragmented and not aligned with the needs of patients, clinicians, and health systems. To address this gap, we conducted a national mixed-methods study to identify the top 10 research priorities for perioperative medicine in Australia.

Using an adapted James Lind Alliance methodology, we partnered with patients, carers, clinicians, and researchers to ensure broad and meaningful engagement. Surveys were distributed via clinics, social media, professional networks, and consumer advocacy groups, inviting participants to submit their most pressing questions about perioperative care. Responses (n=544) were thematically analysed and cross-referenced with existing evidence to identify true uncertainties. A subsequent national priority-setting survey (n=100) and a structured consensus workshop, facilitated by the Health Issues Centre, enabled a diverse group of consumers and health professionals to refine and agree on the final list of priorities.

The resulting priorities reflect urgent clinical and system-level challenges, including equitable access to information for culturally and linguistically diverse patients, improved preoperative decision-making, strategies to reduce surgical infections, enhanced patient-centred care, prehabilitation approaches, optimisation of analgesia, and reliable prediction of perioperative risk. Importantly, more than half of initial respondents were consumers, ensuring the final priorities were deeply informed by lived experiences of surgery.

This project represents the first nationwide priority-setting partnership for perioperative medicine in Australia. By incorporating diverse perspectives, it highlights critical knowledge gaps and ensures future research is patient-centred, equitable, and relevant to end users. The findings provide a clear roadmap for researchers, funders, and policymakers, with potential to reduce research waste, maximise impact, and ultimately improve outcomes for the 2.6 million Australians undergoing surgery each year.

Winner

Alfred Research Alliance - Consumer Involvement in Research

We Keep us Safe: Survivor-Led Research on Community Responses to Domestic, Family, and Sexual Violence (DFSV) Among Criminalised People Who Use Drugs

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Background: Criminalised people with a history of drug use experience high rates of DFSV yet face compounded barriers to safety, including stigma, targeting, and criminalisation when seeking support. Carceral responses often escalate harms, such as misidentification and incarceration of victim-survivors. Despite this, their expertise is rarely recognised in research or policy. This project was initiated and led by criminalised victim-survivors of DFSV with lived experience of drug use, positioning lived expertise as central and using co-design to develop new prevention and response strategies.

Aim: To generate new knowledge on pathways into and out of DFSV for criminalised people who use drugs and to co-design community-led, non-carceral responses.

Methods: Survivor-researchers co-designed the study, developed tools, and conducted qualitative interviews with criminalised victim-survivors (n=13) and men who use violence (n=9). Data were thematically analysed through iterative discussion between survivor- and academic-researchers. A first co-design workshop with women victim-survivors was completed, with further co-design with men and mixed groups planned.

Results (early): Participants described DFSV as inseparable from structural violence, including poverty, incarceration, trauma, and systemic exclusion from services. Criminalised victim-survivors highlighted harmful justice encounters linked to drug use and criminalisation. Men frequently traced their use of violence to victimisation and structural disadvantage, while also expressing willingness to engage in accountability processes outside the legal system. Early co-design with women identified priorities for survivor-led responses including peer-based support grounded in harm reduction, culturally relevant healing, and community accountability.

Conclusion: Early findings demonstrate the harms of current DFSV responses and highlight the potential for survivor-led, co-designed alternatives. The project itself offers a model for future research design and practice initiated and led by consumers, showing how lived expertise can drive innovation in DFSV prevention and response.

Winner

Alfred Health Senior Medical Staff Clinical Research - Junior Medical Researcher

The Effectiveness of an Early Management Guideline for Older Patients Following Blunt Thoracic Injury

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Background: Thoracic injury is a leading cause of trauma related morbidity and mortality worldwide. Older patients (aged ≥65 years) who have sustained rib fractures following blunt chest wall trauma are at greater risk of serious pulmonary complications, prolonged hospital stay, and death compared with the general population. The Blunt Chest-Wall Injury and Rib Fracture Pathway (BCWP) was introduced at our institution in July 2021 and advocates for early aggressive analgesia, specialist support from the Acute Pain Service, consideration of regional techniques and Intensive Care Unit admission.

Methods: A retrospective review of a prospectively maintained trauma registry identified all patients aged ≥65 years admitted to our Level 1 Adult Trauma Centre following blunt chest wall injury between the 1st of January 2019 to 1st of January 2024. The primary outcome measure was proportion of patients receiving an adequate analgesia (AA) regimen. Secondary outcomes included in-hospital mortality and hospital LOS.

Results: 2488 older patients were admitted during the 5-year study period, with 1168 admitted prior, and 1320 post BCWP introduction. Mean age (± SD) was 78.3 (±8.4) and 78.9 (±8.3) while most patients [57.0% (n=666) & 56.3% (n=743)] were male. There was a significant difference in the proportion of patients who received AA with 78.80% (n=892) and 89.91% (n=1158) in the pre- and post-BCWP groups respectively (p <0.001). Regression analysis demonstrated a significant reduction in in-hospital mortality between patients receiving AA and those who had not (OR = 0.59, 95% CI: 0.36-0.98, p = 0.04).

Conclusions: The results demonstrate that the introduction of the BCWP coincided with significantly improved rates early aggressive analgesia among older patients admitted with blunt chest wall injury. Given the vital role of early analgesia within the narrow window of opportunity to prevent significant complications and improve survival these findings appear to support the introduction of the BCWP.

Alfred Health Senior Medical Staff Clinical Research - Junior Medical Researcher

A Systematic Review of Ai-Based Approaches for Automated CT Scan Analysis in Traumatic Brain Injury

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Aim: To assess techniques used in AI models for TBI and quantify their efficiency.

Background: A timely and accurate diagnosis of Traumatic Brain Injury (TBI) is critical for clinical intervention, reducing delays or errors that can result in morbidity or mortality. Non-contrast computed tomography (CT) is the primary imaging modality for acute TBI assessment. Manual assessment and triaging of these CT scans can lead to delays in TBI diagnoses and interventions for severe cases. Advances in artificial intelligence (AI) enable the automated triaging of TBI cases whereby AI models can automatically detect and measure TBI, alerting radiologists to severe cases. This can reduce the time to diagnosis and support clinical decision-making for appropriate interventions. This study systematically reviews the application of AI to TBI diagnosis in CT imaging.

Methods: We adopted the PRISMA guidelines to systematically review peer-reviewed studies that have applied AI models for TBI detection and quantification over the last decade. Our focus was on the application of AI models in identifying neurosurgical features crucial for clinical decision-making, including intracranial hemorrhages, estimation of hematoma volume, midline shift, and mass effect. We identified the characteristics of datasets, data preprocessing methods, proposed algorithms, diagnostic performance, and clinical validation used in TBI detection and quantification AI models.

Results: Screening the 674 publications found, 101 studies were selected for further evaluation. Our findings indicate that deep learning models, specifically convolutional neural networks (CNNs), are the most common and efficient models, achieving sensitivity and specificity above 85%, some exceeding 99%.

Conclusion: AI has the potential to reduce the time to diagnosis in TBI; however, research in AI needs to overcome the real-world challenges of dataset variability, outliers, and regulatory barriers to achieve clinical adoption. Additionally, research into clinical validation is necessary to ensure its clinical safety for deployment in clinical workflows.

Winner

Alfred Health Senior Medical Staff Clinical Research - Senior Medical Researcher

Intravenous Iron to Treat Anaemia Before Cardiac Surgery (ITACS): An International, Randomised, Placebo-Controlled Trial

Myles PS[1,2], Klein A[11], Smith J[2,3], Wallace S[1,2], Forbes A[2], Zavarsek S[4], Symons J[1], Baker R[5], Wood E[2,3], McQuilten Z[2], McGiffin D[6], Christie-Taylor G[7], Soon CK[8], Chan MTV[9], Martin C[2], Richards T[10], and the Australian and New Zealand College of Anaesthetists Clinical Trials Network and the ITACS investigators

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Both anaemia and blood transfusion are associated with increased complications after cardiac surgery. Intravenous iron can reduce transfusion requirements in patients with iron deficiency anaemia, but it is unclear whether this treatment reduces red cell transfusion and improves patient outcomes after surgery.

Methods: This international randomised, double-blind, placebo-controlled trial was undertaken in 33 hospitals across 10 countries. We recruited adult patients with anaemia undergoing elective cardiac surgery. The patients, clinicians, and data collectors were masked as to whether patients received intravenous iron 1000 mg, or placebo, at 1-26 weeks before their expected surgery. The primary outcome was the number of days alive and at home up to 90 days after surgery. Secondary outcomes included transfusion requirements and complications.

Results: Between April 2016, and Dec 2023, 2,993 participants were screened; 995 were randomised, and 466 patients were assigned to intravenous iron and 473 patients to placebo. The resultant haemoglobin concentration on the day of surgery was 121 (SD 14) g/L in the intravenous iron group and 116 (14) g/L in the placebo group (p<0.001). The median number of days alive and at home up to 90 days after surgery in patients assigned to IV iron was 81.1 (IQR 74.8-83.7) and in patients receiving placebo was 80.0 (69.5-83.6), adjusted median difference 1.0 (IQR 0.0-2.1) days; p=0.041. Red cell transfusions were given to 262 patients (61.1%) in the iron group and 302 patients (68.2%) in the placebo group during their hospital stay (relative risk 0·90, 95% CI: 0.82-0.99; p=0.027). There were no differences in major complications or length of hospital stay.

Conclusion: Among patients with anaemia undergoing elective cardiac surgery, preoperative intravenous iron was associated with a reduction in red cell transfusion and more days alive and at home in the first 90 days after surgery.

Alfred Health Senior Medical Staff Clinical Research - Senior Medical Researcher

A Case-Control Study to Investigate the Aetiology of Pelvic Inflammatory Disease (PID)

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Aims: Chlamydia trachomatis (CT) and Neisseria gonorrhoeae (NG) are established causes of acute pelvic inflammatory disease (PID). However, less is known about the association of M.genitalium and bacterial vaginosis (BV) with PID. We aimed to determine the contribution of known STIs (CT and NG) and potential emerging causes (M.genitalium and BV) to PID.

Methods: Case control conducted at Melbourne Sexual Health Centre between 2023-2025. Cases (n=208) were women presenting to MSHC with symptoms of PID who fulfilled CDC clinical criteria for PID on examination. Two control groups comprised: 1) asymptomatic women attending MSHC for STI screening (n=208,"clinic-controls") and 2) asymptomatic women recruited from the community (n=100,"community-reference group"). All participants were tested for CT, NG, and M.genitalium using a NAAT and assessed for BV using the Nugent method.

Results: Cases were significantly more likely to have chlamydia [12%(95%CI:8%–17%)] and gonorrhoeae [6%(95%CI:3%–10%)] detected than the clinic-controls [both detected in 1% (95% CI: 0%–3%,p<0.001)]. Cases were more likely to have M.genitalium [11%(95%CI:7%–16%)] and BV [31%(95%CI:25%–38%)] detected than the clinic-controls [8%(95%CI5%–13%,p=0.234)] and [25%(95%CI:19%–31%,p=0.354)] respectively. Overall, 54%(95%CI:46.6%–60.8%) of PID cases fulfilling CDC criteria had none of the four infections detected compared to 71% [(95%CI 64.2%–77.1%,p<0.001] of clinic-controls. Our reference group did not differ from the clinic-controls in the prevalence of chlamydia [1% (95%CI:0%-5%] or gonorrhoeae [0% (95%CI: 0%–4%)] but had a lower prevalence of M.genitalium [2%(95%CI 0.2%–7%)] and BV [7%(95%CI: 3%–14%)] than the clinic-controls.

Conclusions: This study, using CDC criteria to diagnose PID, confirms an association with both chlamydia and gonorrhoea and PID. Neither M.genitalium nor BV was significantly more commonly detected in PID than clinic-controls. More than 50% of cases had no infection detected, highlighting the need for sequencing studies to identify novel infectious causes of PID to improve testing and care.

Winner

Burnet Institute Prize for Infectious Diseases Research

Bacterial Colonisation and Invasive Infections Among People Who Inject Drugs: Clinical And Molecular Epidemiology

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Background: People who inject drugs are at increased risk of invasive bacterial infections, but the molecular epidemiology in Australia is not well described. Understanding the epidemiology of Staphylococcus aureus and Streptococcus pyogenes colonisation amongst people who inject drugs is essential to inform targeted interventions to prevent invasive infections.

Aim: To determine the prevalence and molecular epidemiology of Staphylococcus aureus and Streptococcus pyogenes colonisation in people who inject drugs.

Methods: We surveyed a community sample of people who inject drugs in Melbourne. Participants provided a combined throat-anterior nares and an axillae swab for S. aureus and S. pyogenes culture. We used univariable logistic regression to identify risk factors of S. aureus and methicillin-resistant S. aureus (MRSA) colonisation. We performed Illumina short-read whole genome sequencing to characterise clonality. We described molecular epidemiology by comparing these colonisation isolates to isolates from three additional geographically matched studies of people who do and don't inject drugs.

Results: We enrolled 305 participants between June 2022 and March 2023. We identified colonisation with S. aureus in 40% (122/305), MRSA in 3% (9/305), and S. pyogenes in 1% (3/305) of participants. We were unable to identify predictors for S. aureus colonisation. Recent incarceration was associated with MRSA colonisation (OR 6.05, 95% CI 1.55 – 25.20). Isolates were clonally diverse, but S. aureus ST12 and ST398 were more common among people who inject drugs, with clusters of high genomic similarity (<25 SNPs) identified involving both superficial and invasive isolates.

Conclusions: S. aureus colonisation is common among people who inject drugs. MRSA colonisation is associated with incarceration. Isolates from people who inject drugs in Melbourne demonstrate genomic diversity. However, we identified clusters of superficial and invasive isolates from people who inject drugs with high genomic similarity, suggesting that colonisation can progress to invasive disease.

Monash University School of Translational Medicine Prize for Neuroscience Research

Intimate Partner Violence Is Associated with Widespread Cortical Thinning and White Matter Microstructural Disruption

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Intimate-partner violence (IPV) exposes millions of women to chronic psychosocial stress and repetitive head trauma. Its cumulative impact on the brain, however, is poorly characterised.

Aim: To investigate structural brain alterations associated with IPV exposure and partner-inflicted brain injury (BI).

Methods: We recruited 78 community-dwelling women: 28 healthy controls with no IPV, 25 survivors of IPV without partner-inflicted brain injury (IPV group), and 25 survivors with ≥ 1 partner-inflicted mTBI or strangulation meeting a threshold of clinical signs via the American Congress of Rehabilitation Medicine criteria (IPV-BI group) were recruited. Participants underwent structural and diffusion MRI to assess cortical thickness, subcortical volumes, and white matter microstructure, quantified by fibre density (FD), log-transformed fibre cross-section (log-FC), and combined fibre density and cross-section (FDC). Group differences and IPV severity effects were analyzed using generalized linear models across 193 cortical and subcortical regions and 52 white matter tracts.

Results: Compared to controls, the IPV group exhibited widespread cortical thinning across 54 regions ($q < 0.05$), including the anterior cingulate, orbitofrontal, superior temporal, insular, and precuneus cortices, as well as reduced volumes in the cerebellum, hippocampus, amygdala, and putamen. Seventy-nine white matter metrics differed between controls and the IPV group, predominantly in log-FC (50 findings) and FDC (25 findings). Unexpectedly, IPV-BI participants did not show similar group-level differences compared to controls. However, greater IPV severity and brain injury exposure was significantly associated with more pronounced morphometric changes ($p < 0.05$).

Conclusion: IPV is linked to widespread cortical, subcortical, and white matter abnormalities, with changes scaling with both cumulative abuse and partner-inflicted brain injury. These findings highlight the urgent need for systematic neurological assessment and tailored rehabilitation strategies for IPV survivors.

MPCCC Prize for Best Abstract in Cancer Research

Reduced Serum Baseline Kynurenine is Associated with Acute Graft-Versus-Host Disease in Allogeneic Stem Cell Transplant Recipients

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Introduction: Allogeneic stem cell transplantation (alloSCT) is a potentially curative therapy for high-risk haematologic malignancies. Acute graft-versus-host disease (aGVHD) occurs when donor immune cells attack host tissues. Kynurenine, a tryptophan-derived metabolite, regulates immunity through activation of the microbiota-derived aryl hydrocarbon receptor (AhR), a pathway involved in inflammation resolution and immune tolerance. Prior work by Michonneau et al. (2019) demonstrated reduced N-acetyl-kynurenine at the onset of aGVHD, suggesting the relevance of kynurenine in aGVHD pathogenesis.

Methods: Serum samples were collected from consecutive alloSCT recipients after conditioning and before stem cell infusion (Day 0). Patients were monitored twice weekly until Day 100 for aGVHD and complications. Metabolic profiling was performed by high-performance liquid chromatography–mass spectrometry (HPLC–MS). Relative kynurenine levels were quantified by peak intensity and compared between patients who developed aGVHD and controls using Welch's t-test. (GraphPad Prism Version 10.2.0). Receiver operating characteristic (ROC) analysis was conducted in R (v4.4.3).

Results: Ninety-seven patients had available samples; 30 developed aGVHD and 67 served as controls. Median age was 60 years (range: 18–74 years). Most received reduced-intensity conditioning (62.4%) and an HLA-matched graft (70.3%). One control patient died early (<14 days post-transplant) and was excluded, as aGVHD could not be assessed before this timepoint. The median time to clinical aGVHD onset was 50 days. Baseline kynurenine levels at Day 0 were significantly lower in patients who subsequently developed aGVHD compared with controls (fold change 0.79, p=0.024). ROC analysis yielded an acceptable AUC value of 0.69.

Conclusion: Lower pre-transplant kynurenine levels were associated with subsequent development of aGVHD after alloSCT, supporting a role for kynurenine in early immune dysregulation in aGVHD pathogenesis. Further work to examine kynurenine as a potential biomarker of aGVHD, including absolute quantitation of its concentrations and downstream metabolites, at earlier timepoints is warranted.

Reference: [1]Michonneau, D., Latis, E., Curis, E. et al. Metabolomics analysis of human acute graft-versus-host disease reveals changes in host and microbiota-derived metabolites. *Nat Commun* **10**, 5695 (2019). https://doi.org/10.1038/s41467-019-13498-3

Winner

MPCCC Prize for Best Abstract in Cancer Research

Incidence of Pseudoprogression on 18F-FDG PET/CT in Metastatic Melanoma Patients Undergoing Immune Checkpoint Inhibitor Immunotherapy

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Aim: To evaluate the incidence of pseudoprogression on ^{18}F-FDG PET/CT scans in metastatic melanoma patients commencing immune checkpoint inhibitor therapy and to determine the average time to confirmed ^{18}F-FDG PET/CT response in the pseudoprogression cohort identified.

Methods: Patients with metastatic melanoma who underwent baseline and follow-up ^{18}F-FDG PET/CT scans after commencing immune checkpoint inhibitor therapy at Alfred Hospital (2012–2023) were retrospectively reviewed. Cases of pseudoprogression were identified by a keyword search of reports and confirmed on image review by a nuclear medicine physician. Data on timing of confirmed response, immune-related adverse events, and autoimmune history were also collected.

Results: 10/401 (2.49%) metastatic melanoma patients were confirmed as having pseudoprogression on PET/CT. 8/10 (80%) had new FDG-avid lesions and 2/10 (20%) an increase in size and SUVmax of original disease. 8/10 (80%) of patients achieved complete metabolic remission on subsequent PET/CT scans with an average time to confirmed reduction of disease on PET/CT of 28.4 weeks. 4/10 (40%) received dual agent immunotherapy. 8/10 (80%) developed irAEs of varying type and severity. 2/10 (20%) had a history of pre-existing auto-immune disease. 9/10 (90%) of pseudoprogression patients are alive at last review.

Conclusion: Pseudoprogression on ^{18}F-FDG PET/CT occurred in approximately 2.5% of metastatic melanoma patients commencing immunotherapy with an average time to subsequent confirmed response of ~ 6 months. This highlights the importance of not ceasing immunotherapy prematurely based on early ^{18}F-FDG PET/CT findings.

Winner

Monash Alfred Psychiatry Research Centre (MAPRC) Prize for Psychiatry Research

Australian Adults with Migraine Commonly Have Clinically Significant Levels of Previous Childhood Trauma

Dr Lakshini Gunasekera[1,2,3], Dr Shobi Sivathamboo[1,2], Dr Eveline Mu[2,3], Prof Terence O'Brien[1,2], Prof Helmut Butzkueven[1,2], Dr Elspeth Hutton[1,2] and Professor Jayashri Kulkarni[2,3]

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Background: Large international studies show that childhood abuse is a risk factor for migraine development; it almost doubles the risk of developing migraine when compared to those without a history of childhood trauma. Previous abuse includes verbal abuse, physical abuse, sexual abuse, neglect, or witnessing confronting experiences. Early trauma may alter neurobiological processes that lower pain thresholds or amplify pain signals. There is no Australian literature regarding the co-prevalence of childhood abuse and the development of migraine.

Aim: To describe the prevalence of past childhood trauma in adults who experience migraine and the most common trauma subtypes.

Methods: Single-centre, prospective, survey-based sampling of adults fulfilling International Classification of Headache Disorders-3 diagnosis of migraine by a neurologist. Patient demographics and self-reported Adverse Childhood Events Questionnaire (ACE-Q) scores were collated and reported as proportions.

Results: Between 1st January 2024 and 20th June 2025, 1218 patients were diagnosed with migraine by a neurologist. Of these, 39% (462/1218) responded to our survey. Respondents were mostly female (376/456, 82%) with a mean age 46.9 years (SD 13.9). Clinically significant (ACE-Q ≥4) was reported by 40% of migraine patients (182/465).Reported trauma types included verbal abuse (32%), parental mental illness (30%), physical abuse (24%), parental divorce (23%), sexual abuse (18%), parental substance abuse (17%), emotional neglect (16%), witnessing parental domestic (12%), physical neglect (8%), and parental incarceration (4%).

Conclusion: Australian adults with migraine commonly report childhood trauma, most commonly verbal abuse. These findings highlight trauma as a potential risk factor for migraine. Future studies examining the timing and severity of trauma may clarify underlying mechanisms and inform trauma-focused therapeutic approaches.

Winner

Dr Michael J Hall Memorial Prize for Respiratory Medicine

Virtual ethnography of singing for breathing in people with COPD and ILD

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Introduction/Aim: Many internationals in-person singing for lung health programs have demonstrated benefits in improving participants' breathlessness and quality of life, but the onset of the pandemic prompted a shift to online delivery. Limited research exists regarding how online delivery of these programs impacts participants' interactions and behaviours. This study evaluated how the digital format influences participant engagement in an Australian-wide program "SINFONIA: A clinical trial examining the benefits of SingINg For breathing in COPD aNd ILD pAtients."

Methods: A virtual ethnographic study was conducted, including observations of 18 participants with chronic obstructive pulmonary disease and interstitial lung disease across 20 weekly 1.5-hour Zoom sessions led by two singing leaders. Analysis of qualitative data yielded descriptive and analytical themes.

Results: Three themes emerged: (1) adaptation and community building; (2) evolution of group dynamics; and (3) dynamics of leadership and influence. As the singing program progressed, participants formed social connections that transcended geographical limitations, both facilitated and inhibited by online delivery. The program fostered a supportive environment where participants could normalise their conditions, thus challenging stigmas and promoting resilience within the evolving group dynamics, which were shaped by the leaders.

Conclusion: Evolving relationships and group dynamics were observed, emphasising the importance of managing online group social dynamics and balancing guidance with participant autonomy in future programs.

Grant support:

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Winner

Professor Daniel Czarny Prize for Allergy, Asthma and Clinical Immunology

Functional Assessment of the NOD2 Signalling Pathway in Patients With Inborn Errors of Immunity

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Background: Majority of patients with inborn errors of immunity (IEI) lack identification of disease-causing genetic variants. Causal defects affect limited immune pathways, including NOD2 signalling. To advance diagnostics, we developed an ex-vivo functional assay to evaluate NOD2 signalling, enabling validation of variants of unknown significance, and providing functional insights in patients without a causal defect.

Methods: Blood monocytes from 14 healthy donors, 27 IEI patients lacking a causal variant, and three patients with a hemizygous variant in X-linked Inhibitor of Apoptosis (XIAP) were stimulated with L18-MDP (NOD2-dependent), or LPS (NOD2-independent), or left unstimulated. TNF-α, phosphorylated-p38 (p-p38) and p-p65 were measured via flow cytometry. WES was performed on all patients.

Results: In healthy donors, L18-MDP induced TNF-α production in 58% (range 22.2-90.1%) of monocytes, and a fold-change (relative to LPS stimulation) in median fluorescence intensity (MFI) of 1.04 (range 0.69-1.3) and 0.80 (range 0.67-0.98) for p-p38 and p-p65. Patients with XIAP variant had 0% (0%-0.63%) of monocytes producing TNF-α, and MFI fold-change of 0.64 (0.5-0.79) and 0.50 (0.27-0.64) of p-p38 and p-p65, respectively. No significant difference was observed between healthy donor and genetically unexplained patients. Of the 27 patients, 15 had at least one read-out outside of the healthy donor range. Initial WES analysis showed these 15 patients had a median of 8 rare (minor allele frequency, MAF <0.01), or 3 ultra-rare (MAF <0.001) variants in the 397 NOD2 signalling pathway genes.

Conclusion: Assessment of NOD2-dependent TNF-α, p-p38 and p-p65 can identify patients with potential abnormal NOD2 pathway function, supporting exploration of rare NOD2 pathway gene variants. Future analysis will involve in-silico and in-vitro evaluation of these variants to determine causality. A pathway-focused approach, such as described here, could streamline candidate variant identification and thus increase genetic diagnosis rates in IEI and other rare diseases.

Noel and Imelda Foster Prize for Cardiovascular Research

Are Cardiovascular Risk Assessment Tools Predictive for Coronary Plaque Burden?

Cheng Hwee Soh[1,2,3], Nitesh Nerlekar[1,4,5], Kristyn Whitmore[1,6], Gerald F Watts[7], Stephen J Nicholls[4,5,8], Thomas H Marwick[1,2,6]

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Background: Multiple atherosclerotic cardiovascular disease (ASCVD) risk assessment scores have been developed to guide treatment decisions. These tools were developed to predict CV events, but we are now in the position of using them to identify patients who might benefit from coronary plaque imaging. Their association with plaque burden and progression is unclear.

Aim: To evaluate the association between ASCVD risk assessment scores with coronary plaque burden among asymptomatic individuals.

Method: Individuals aged 40-70 years with a family history of coronary artery disease and not on statin therapy were recruited. Participants' risk scores were calculated at baseline and underwent computed tomography (CT) coronary angiography (CTCA) when coronary calcium score (CAC) was >0. CTCA was repeated at 3-year follow-up.

Results: Of 1060 participants (mean age 56±7 years, 53.6% female) who underwent CAC scoring, 499 (44.2%) had positive CAC scores. Subsequently, 365 participants completed both baseline and follow-up CTCA. The average baseline total lesion count was 3±2 with a total plaque volume of 116.3±113.9mm^3. Spearman correlation between the Pooled Cohort Equation (PCE, mean score 6.9±5.1%), the PREVENT 10-year ASCVD (mean score 3.6±2.0%) and the Australian 10-year CVD (mean score 12.3±6.7%) risk scores with total plaque volume at baseline were R=0.019, R=0.025 and R=0.018 (Figure 1). For changes in plaque volume at 3-year follow-up, corresponding correlations for the risk scores were R=-0.021, R=0.046 and R=-0.064. Multivariable linear regression analyses, adjusted for age, sex, statin prescription after baseline CTCA, cholesterol levels, diabetes and hypertension, showed that the Australian 10-year CVD risk scores had the strongest association with the changes in total plaque volume (β=-1.123 [0.429], p=0.009).

Conclusion: The Australian 10-year CVD risk score best reflects coronary plaque progression over three years. However, none of them accurately reflect individuals' coronary plaque characteristics at baseline, limiting their utility as screening tools to guide CAC/CTCA referral.

Winner

Noel and Imelda Foster Prize for Cardiovascular Research

Decrease In Heart Failure Mortality Lags Behind Atherosclerotic Cardiovascular Disease Mortality in People with Diabetes

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Background/Aim: Contemporary trends in cardiovascular disease (CVD) cause-specific mortality by diabetes status, particularly heart failure (HF) mortality, are inadequately described. We performed the first multi-country analysis of trends in mortality due to coronary heart disease, cerebrovascular disease and HF in people with diabetes, compared to people without diabetes, across nine high-income jurisdictions worldwide.

Methods: CVD cause-specific mortality data in people with and without diabetes from nine jurisdictions were assembled (Europe (n=5), Australia, Canada (n=2) and South Korea), spanning 2000 to 2023. Using Poisson regression, we estimated mortality rates and mortality rate ratios for deaths due to coronary heart disease, cerebrovascular disease and HF.

Results: We analysed 2.92 million deaths over 1.30 billion person-years of follow-up. In all jurisdictions, coronary heart disease mortality rates fell across the observed time period in people with and without diabetes. The five-year percent changes in coronary heart disease mortality ranged from −11·5% to −32·3%. Reductions in HF mortality were smaller than those for coronary heart disease mortality (except in Scotland) and smaller than those for cerebrovascular mortality (except in Scotland and Denmark). HF mortality increased in Ontario (Canada). The excess coronary heart disease mortality associated with diabetes (mortality rate ratio ~2·0) fell in three of eight jurisdictions and was stable or the trend was uncertain in the remainder. No jurisdiction had a fall in excess HF mortality associated with diabetes.

Conclusions: Declines in HF mortality have lagged behind declines in coronary heart and cerebrovascular disease mortality. Excess HF mortality associated with diabetes has not declined. Greater efforts are required to reduce HF mortality in people with and without diabetes. This includes targeting existing cardioprotective therapies towards those at high risk of HF death.

Winner

Baker Heart and Diabetes Institute Prize for Cardiovascular Research

Spatial Subcellular Proteo-Lipidomic Mapping of Mouse Hearts

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The heart is a highly structured organ whose function depends on the precise, tightly regulated, yet dynamic localisation of biomolecules—including proteins and lipids—to enable coordinated interactions in subcellular niches. While detailed profiling of individual subcellular compartments has provided valuable insights, understanding how proteins and lipids are spatially organised and functionally connected across the entire tissue remains challenging, particularly when considering sex-dependent differences and the complexity of large-scale multi-omics integration from diverse molecular types.

Here, we present high-resolution subcellular proteome and lipidome maps of mouse hearts, revealing both conserved and heterogeneous molecular features at the organ-wide scale. We developed a multi-omics workflow that combines (1) ten-step sequential organelle fractionation, (2) single-tube protein and lipid extraction, (3) ultrasensitive mass-spectrometry acquisition, (4) supervised machine-learning-based subcellular classification, and (5) differential subcellular distribution analysis.

This strategy resolves the spatial organisation of over 7,000 proteins and 600 lipids across both membranous and membraneless compartments, defining fourteen distinct subcellular patterns ranging from large organelles (mitochondria, nucleus) to small protein complexes (ribosomes, proteasomes). By constructing a supervised machine-learning model, we generated maps that reveal co-localised protein networks and functional links between subcellular niches. This model also accurately predicts the localisation of mitochondria-specific cardiolipin lipids, consistent with their established roles in mitochondrial bioenergetics, dynamics, and signalling, underscoring the biological relevance of this integrated proteo-lipidomic framework.

Furthermore, this approach enables characterisation of sex-dependent subcellular remodelling, revealing spatial redistribution of immune-related proteins, kinases, transcription factors, and phospholipids between male and female hearts. Together, this comprehensive subcellular multi-omics map serves as a foundational resource for understanding cardiac molecular organisation, advancing the study of sexually dimorphic biology, and enabling future exploration of dynamic organ states of the heart in health and diseases.

Baker Heart and Diabetes Institute Prize for Diabetes Research

Use of the Energy Waveform Electrocardiogram to Detect Subclinical Left Ventricular Dysfunction in Patients with Type 2 Diabetes Mellitus

Cheng Hwee Soh[1,2,3], Alex G.C. de Sa[2,4,5]. Elizabeth Potter[1], Amera Halabi[1], David B Ascher[2,4,5], Thomas H Marwick[1,2,6]

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Background: Recent guidelines propose N-terminal pro-B-type natriuretic peptide (NT-proBNP) for recognition of Stage B Heart Failure (SBHF) in patients with type 2 diabetes mellitus (T2DM). An energy waveform electrocardiogram (ewECG) provides frequency and energy features that machine learning can use as additional inputs to improve the identification of SBHF.

Aim: To evaluate whether machine learning model based on ewECG features was superior to NT-proBNP, as well as a conventional screening tool—the Atherosclerosis Risk in Communities (ARIC)-HF risk score, in SBHF screening among patients with T2DM.

Method: SBHF was defined as diastolic dysfunction (DD), reduced global longitudinal strain (GLS ≤ 18%) or LV hypertrophy (LVH). Supervised machine learning was adopted to identify the optimal combination of ewECG extracted features for SBHF screening in 178 participants in one trial and tested in 97 participants in the other trial. The accuracy of the ewECG model in SBHF screening was compared with NT-proBNP and ARIC-HF.

Results: SBHF was identified in 128 (72%) participants in the training dataset (median 72 years, 41% female) and 64 (66%) in the validation dataset (median 70 years, 43% female). Fifteen ewECG features showed an area under the curve (AUC) of 0.81 in identifying SBHF, significantly better than both NT-proBNP (AUC 0.56, $p < 0.001$) and ARIC HF (AUC 0.67, $p = 0.002$). ewECG features were also led to robust models screening for DD (AUC 0.74), reduced GLS (AUC 0.76) and LVH (AUC 0.90).

Conclusion: Machine learning based modelling using additional ewECG extracted features are superior to NT-proBNP and ARIC HF in SBHF screening among patients with T2DM, providing an alternative HF screening strategy for asymptomatic patients and potentially act as a guidance tool to determine those who required echocardiogram to confirm diagnosis.

Lucy Battistel Memorial Prize for Best Allied Health Researcher

The Effect of Nutrition Impact Symptoms on Nutrition Status After Completion of Curative-Intent Treatment for Gastric, Oesophageal, and Pancreatic Cancer: A Systematic Review

Emma McShane [1,2], Lauren Hanna [3], Carmel Zoanetti [2], Lisa Murnane [2,4], Brenton Baguley[5,6] and Kate Furness [1*]

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Cancers of the upper gastrointestinal (UGI) tract such as gastric, oesophageal, and pancreatic cancers are common worldwide. Survival rates remain low but are slowly improving due to advances in curative treatments. However, these treatments often cause long-term nutrition impact symptoms that are frequently under-recognised, under-diagnosed, and under-treated, leading to malnutrition and poorer health outcomes.

Aim: This review explored the types of nutrition impact symptoms following curative-intent treatment for UGI cancers and assessed their impact on nutrition status.

Methods: A systematic search of four electronic databases: Ovid MEDLINE, Embase via Ovid, Scopus, and Cochrane Library identified studies involving adults treated with curative-intent for UGI cancers. Included studies reported both nutrition impact symptoms and nutrition outcomes using validated tools. Study quality was assessed using the Academy of Nutrition and Dietetics Quality Checklist for Primary Research, and a narrative synthesis was completed.

Results: Eleven studies (n = 953 participants), predominantly from the Asia–Pacific region, met the inclusion criteria. Participants were mostly male (68%), with surgery as the primary treatment (91%). Most studies (n = 10) used validated assessment tools to identify nutrition impact symptoms. Reflux was the most commonly reported symptom (n = eight studies), followed by abdominal pain, constipation and diarrhoea. Nutrition status was assessed using various validated tools: Patient-Generated Subjective Global Assessment (n = six studies, 55%), Mini Nutritional Assessment (n = two studies, 18%), and Global Leadership Initiative on Malnutrition as well as Subjective Global Assessment and Prognostic Nutritional Index (both n = one study, 9%). Malnutrition prevalence was up to 87% one-year post-treatment.

Conclusion: Nutrition impact symptoms frequently persist following curative-intent treatment for UGI cancers. Future studies should use validated assessment measures and include follow-up beyond 12 months. The incorporation of ongoing, individualised dietetic support to monitor and manage these symptoms is essential for optimising patient outcomes.

Winner

Henrietta Law Memorial Prize for Best Novice Allied Health Researcher

Parkmoves: An Interdisciplinary Group Enhances Patient and Hospital Outcomes on a Subacute Aged Care Ward

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Background: Timely, person-centred, rehabilitation is essential for optimising function and facilitating safe discharge in older adults. In February 2025, Alfred Health established 'Parklands', a 15-bed geriatric rehabilitation ward. To enhance rehabilitation intensity and staffing limitations, the allied health team implemented 'Parkmoves', an interdisciplinary face-to-face group therapy program focused on targeting functional mobility, activities of daily living, cognition and fatigue.

Aim: To evaluate the impact of an interdisciplinary group program on rehabilitation intensity, and patient and hospital outcomes.

Method: Parkmoves sessions were delivered by an occupational therapist (OT), physiotherapist (PT) or allied health assistant three times weekly for one hour with 2-8 participants in the ward gym. A retrospective audit compared two 7-week periods pre and post implementation. Data included occasions of service, functional outcomes (Functional Independence Measure [FIM] score minimal clinically important difference [MCID] 22; Functional Autonomy Measurement System [SMAF] handicap MCID 5) and discharge destination. Descriptive statistics and comparative analysis were used.

Results: The pre-group (n=45) and post-group (n=47) cohorts were comparable in age (mean pre 82 vs post 81 years), and proportions of patients at risk of delirium (62% vs 57%) and falls (64% vs 62%). Total OT occasions of service increased from 151 to 376; PT from 240 to 335. Mean therapy occasions per patient rose from 16 to 20, with each session lasting an average of 22 minutes longer. With regard to functional outcomes, a greater improvement in FIM score (19 vs 28) and SMAF handicap (3 vs 8) were demonstrated, both reaching clinically meaningful thresholds only after group implementation. This coincided with a higher proportion of patients discharged home (47% vs 66%).

Conclusion: Parkmoves significantly increased therapy intensity and was associated with clinically meaningful improvements in patient function and discharge outcomes. This interdisciplinary model demonstrates the value of collaborative group therapy in subacute aged care.

Winner

Best Allied Health Research into Practice Award

Feasibility, Acceptability, And Delivery of an Ultra High-Dose Community-Based Mobility Booster Program After Stroke

Scrivener K[1,2], Ball E[3], Dean C[3], Glinsky J[4], Ada L[4], Graham P[3], Campbell J[3], Christie L[5], McCredie L[1], Kramer S[2], Felton K, Lannin N[1,2]

1. Alfred Health, 2. Monash University, 3. Macquarie University, 4. University of Sydney, 5. St Vincent's Health Network

Long-term mobility limitations are common after stroke, yet access to intensive rehabilitation in the chronic phase remains limited. High-dose programs may offer a promising approach to improve walking outcomes, but their feasibility, acceptability, and implementation in community settings require investigation.

Aim: This study evaluated the feasibility and acceptability of a high-dose community-based mobility booster program (HiWalk) for stroke survivors and explored the perspectives of both participants and therapists involved in program delivery.

Design: A multi-site, assessor-blinded pilot randomised controlled trial was conducted in two community rehabilitation gyms. Nested mixed-methods studies explored therapist and participant experiences.

Methods: Participants were 6 months to 8 years post-stroke and able to walk 10 metres unaided at 0.4–1.0 m/s. The HiWalk intervention involved 43 hours of intensive motor training over 3 weeks, targeting mobility, balance, and strength. Feasibility was assessed via adherence, safety, and training dose. Therapist perspectives were explored through surveys, observational audits, and interviews informed by the Theoretical Domains Framework (TDF). Participant acceptability was assessed via interviews analysed using the Transtheoretical Framework of Acceptability (TFA).

Results: Forty-seven participants (mean age 58 years, SD 16; mean time post-stroke 2.7 years, SD 2.1) completed the trial. Adherence was high (91%, SD 13), with minimal adverse events (0.4/week). Participants completed 567 repetitions/hour (SD 171), with mobility training accounting for the highest volume (860 repetitions/hour, SD 420). Stroke survivors reported high acceptability and motivation to participate, despite barriers such as fatigue and competing life roles. Therapists valued high-dose training but noted challenges related to participant capability and resource constraints. Facilitators included pre-program training, team support, and accessible program materials.

Conclusion: HiWalk was feasible and acceptable for stroke survivors in community settings, with high adherence and safety. Successful delivery was supported by therapist training, team collaboration, and participant motivation, highlighting key implementation strategies for scaling high-dose rehabilitation programs.

Winner

Alfred Health Nursing Research Award for Best Abstract

Home-Based Eligibility Analysis and Recommendation Tool (Heart): Using Machine Learning to Identify In-Hospital Patients for At-Home Care – A Genmed Hith Dataset

Francis Dignam[1], Theo Christian[2], Christopher Berry[2], William Librata[2], Michael Davis[2], Zaf Alam[2], Bianca Conway[1], Lucy O'Connell[1], Claire Johnston[1], Alice Fly[1], Liz Rochford[1], Jane Elliot.

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Aim: To develop a robust and reliable tool for identifying hospitalised patients suitable for home-based care. The Home-based Eligibility Analysis and Recommendation Tool (HEART) uses machine learning to support ward teams in identifying candidates and prompting timely discharge planning discussions.

Method: Retrospective General Medicine (Gen Med) patient episodes from March 2023 to March 2025 were analysed, focusing on three clinical note types: Medical IP Progress Note, Emergency Nursing Notes, and Emergency Medical Record. Episodes were grouped into those admitted to Hospital in the Home (HITH) (~1,500) and those not (~50x larger). To address class imbalance, ~4,000 control episodes were randomly sampled.

Episodes with >30 notes were excluded to meet model input limits. A smoothing method was applied to simulate earlier suitability detection: for episodes with >2 notes, 50% retained only the first half of their notes. Notes were ordered latest to earliest to prioritise recent clinical data. This refined dataset was used to train the initial model, later enhanced using live clinical reviews.

Results: During deployment, 433 patients were screened using HEART. Of these, 60% were deemed suitable or likely to be suitable for home-based care within 24 hours, while 40% were assessed as not suitable. Among suitable patients, 50% had not previously been assessed or planned for home-based care prior to HEART screening.

Ward teams and relevant home-based programs were notified of suitable patients, enabling a combination of proactive discharge planning and service-led transfers.

Conclusion: HEART demonstrates the potential of machine learning to augment clinical decision-making and progression-of-care processes. It reliably identifies patients eligible for home-based care, supports timely discharge planning, and enhances coordination between inpatient teams and community services.

Winner

Alfred Health Emerging Nursing Research Award for Best Abstract

A Realist-Informed Evaluation of a Rapid Response System for Mental State Deterioration in Acute Hospitals: Testing Program Theories Through Interviews

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Background: Effective management of patient mental state deterioration in acute hospital settings is crucial due to its significant impact on both patients and staff. However, inconsistencies in management strategies highlight the need for standardised approaches. We adopted a realist evaluation approach to gain insights into staff perceptions and experiences, exploring how, for whom and under what circumstances the DIvERT (De-escalation, Intervention, Early, Response, Team) system, a rapid response system functions in practice.

Methods: We conducted 23 semi-structured interviews with clinical staff from two pilot acute hospital settings. The qualitative data were analysed to identify key themes and contextual factors that influence the system's functioning, providing insights into the mechanisms through which DIvERT facilitates proactive intervention.

Findings: Findings indicated that ward staff valued a structured approach and benefited from interdisciplinary collaboration with mental health experts, which improved their clinical knowledge and confidence. A supportive ward culture, characterised by teamwork and open communication, facilitated collaboration and response effectiveness. However, bedside nurses often deferred escalation decisions to senior staff, have to balance prioritising immediate medical needs over proactive risk management. Inconsistent training, unclear escalation pathways and knowledge gaps, particularly among new graduates, limited system efficiency. Resource shortages and scheduling conflicts further constrained timely responses.

Conclusion: Promoting proactive risk management and communication is essential for improving care for patients with mental state deterioration in acute healthcare settings. Organisational structure, staff training, and resource allocation influence the effectiveness of response systems. Consistent training, clear escalation guidelines, and the use of assessment tools are fundamental. A supportive ward culture with open communication and teamwork increases system effectiveness. Addressing resource constraints and workload acuity is vital to improve staff attendance at response meetings and ensure timely interventions.

Winner

Alfred Health Senior Medical Association Research Encouragement Award

A Delphi Survey to Develop International Consensus on the Timeframe for Defining a Hospital-Acquired Pressure Injury (HAPI)

Kathren F. Puyk, Michelle M. Tuck, Judy A. Reeves, Robin L. Digby, Hermione E. Shea, Tracey K. Bucknall

Background: Pressure Injuries (PI) have a significant impact on the patient and healthcare organisations. Early detection is crucial to implement strategies for managing and preventing further patient harm. Many studies discuss the prevalence rate of a hospital acquired pressure injury (HAPI) but very few define the actual time frame, from admission, that was used to measure harm.

Purpose: The purpose of this study was to identify the time frames used internationally to report a hospital acquired pressure injury (HAPI) and to obtain expert consensus of what time frame defines a HAPI.

Methodology: This research used a Delphi survey design. Expert participants were identified though national and international organisations and contacts. Participant information and consent forms were emailed prior the survey being sent to consenting participants. International experts comprised of 43 individuals from 11 countries, 42 were nurses. Three rounds were conducted from September 2022 to June 2023. A percentage level agreement or consensus was set at >70%. Items with less than 70% were removed.

Results: This research highlighted the different international interpretations in defining a HAPI. It ranged from 0 hours to 96 hours from admission. After three Delphi rounds, expert consensus was reached. A HAPI is defined as occurring over 8 hours and up to 24 hours following admission.

Conclusion: Inconsistencies in HAPI definitions impact incident reporting, coding, and correct allocation of harm from a PI as present on admission or a hospital-acquired complication. It also impacts benchmarking, across point prevalence studies. Using expert consensus, a HAPI definition was reached. Future research could use the definition for benchmarking in point prevalence and incidence studies. Further international research is recommended to test this Delphi consensus. This research was published in the Wound Repair and Regeneration journal.

Alfred Health Senior Medical Association Research Encouragement Award for an Early Career Researcher

A Mixed Methods Study to Identify Australia's Top 10 Research Priorities for Perioperative Medicine
Short title: Perioperative Medicine Research Priorities in Australia

Sophie K. A. Wallace, Tracey K. Bucknall, Andrew Forbes and Paul S. Myles,

Perioperative medicine plays a critical role in improving surgical outcomes, yet research efforts are often fragmented and not aligned with the needs of patients, clinicians, and health systems. To address this gap, we conducted a national mixed-methods study to identify the top 10 research priorities for perioperative medicine in Australia.

Using an adapted James Lind Alliance methodology, we partnered with patients, carers, clinicians, and researchers to ensure broad and meaningful engagement. Surveys were distributed via clinics, social media, professional networks, and consumer advocacy groups, inviting participants to submit their most pressing questions about perioperative care. Responses (n=544) were thematically analysed and cross-referenced with existing evidence to identify true uncertainties. A subsequent national priority-setting survey (n=100) and a structured consensus workshop, facilitated by the Health Issues Centre, enabled a diverse group of consumers and health professionals to refine and agree on the final list of priorities.

The resulting priorities reflect urgent clinical and system-level challenges, including equitable access to information for culturally and linguistically diverse patients, improved preoperative decision-making, strategies to reduce surgical infections, enhanced patient-centred care, prehabilitation approaches, optimisation of analgesia, and reliable prediction of perioperative risk. Importantly, more than half of initial respondents were consumers, ensuring the final priorities were deeply informed by lived experiences of surgery.

This project represents the first nationwide priority-setting partnership for perioperative medicine in Australia. By incorporating diverse perspectives, it highlights critical knowledge gaps and ensures future research is patient-centred, equitable, and relevant to end users. The findings provide a clear roadmap for researchers, funders, and policymakers, with potential to reduce research waste, maximise impact, and ultimately improve outcomes for the 2.6 million Australians undergoing surgery each year.

2025

New Thinking.
Real Impact.

Alfred Research Alliance Consumer Involvement in Research Award

We VALUE everyone's place at the table

Biran Y [1,2], Aydin G [3], Irving A [3], Zhang X [3], Cruse B [4], Blum S [5], Reddel S [6], Buzzard K [7], Van der Walt A [1,2], Petrie D [3]

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Introduction: VALUE-MG is a health-economic study examining the cost-effectiveness of intravenous immunoglobulin (IVIg) therapy in people with Myasthenia Gravis (MG) in Australia. The government-funded study is designed as a unique collaboration between clinicians, patients, researchers, stakeholders, and consumer groups.

Objective: VALUE-MG aims to assess and justify the clinical guidelines for cost-effective and equitable use of IVIg therapy, versus comparator treatments, to impact the clinical care and wellbeing of Australians with MG.

Methods: In partnership with MSBase Foundation, the MGBase registry will enable participant recruitment and provide clinical effectiveness data from five hospital sites in three states. Quality-of-life (QoL) data will be prospectively collected from 300 participants completing quarterly electronic patient-reported outcome measures (ePROMs). Healthcare use and costs will be tracked via hospital and government administrative data. The invaluable contribution of Myasthenia Alliance Australia (MAA) span from study design and promotion, recruitment for Discrete Choice Experiments (DCEs), through to disseminating key findings. VALUE-MG has also teamed with OPTIMAL Centre of Research Excellence to build capacity and implement study outcomes.

Expected Results: Applying quantitative analysis on a comprehensive dataset, which will be generated by linking de-identified data from different sources, will enable the development of health economic models to determine the cost-effectiveness of IVIg therapy strategies in Australians with MG.

Summary: VALUE-MG will provide an evidence-base to guide clinical practice towards more cost-effective and equitable IVIg use for MG. The study will provide people with MG with data on the optimal dose, frequency and duration of IVIg therapy. Clinicians will be able to apply the study's outcomes to select the most appropriate MG treatments, thus improving their patients' overall well-being. Moreover, policymakers will rely on the study's findings to make evidence-based decisions for allocating healthcare resources to maximise the benefits for patients and the Australian healthcare system as a whole.

Alfred Research Alliance Consumer Involvement in Research Award

More Than Just a Token – A Co-Investigation of Carer Identity and Role in the Mental Health Lived and Living Experience Workforce

Rozario J, Hopkins L, D'Mello G, Simpson A, Jayadeva T

As a recovery focus in care becomes more deeply embedded in mental health care service delivery, policy and practice, the Lived and Living Experience Workforce (LLEW) is assuming a greater prominence and role within clinical settings. The carer LLEW (CLEW) however, lags behind consumer roles in most cases, mirroring a traditional attitude towards carers as support players in the mental health space. Yet carers form an important component of the overall care system and offer an important perspective on all aspects of service design and delivery.

Increasingly, as part of the CLEW role within clinical health services, carer peer workers are invited to participate in numerous activities, including co-design processes. These co-designs, which require genuine inclusion of lived and living experience voices, frequently draw on the carer identity to enhance the diversity of perspectives and the appropriateness of the eventual outcomes. Little is yet known, however about the experiences of carers in participating in these spaces.

This paper reports on the investigation of carer experience in taking part in the co-design of a research project to be conducted within an acute inpatient mental health ward. The research project has been designed to encompass LLEW perspectives at all stages of the research, from study design, methodology and data collection to discussion and triangulation of results. The paper will be co-written by carers and researchers using an auto-ethnographic approach to examine the experience of working collaboratively across discipline and identity boundaries. It aims to expand the recognition of the carer role as more than just a token inclusion, to build on understandings of the value and richness of experience encompassed with the carer identity.

Alfred Research Alliance Consumer Involvement in Research Award

Australian Clinical Practice Guideline for Physical Rehabilitation and Mobilisation in Adult Intensive Care Units

Carol L Hodgson, Tessa Broadley, Michelle Paton., Alisa M Higgins, Shannah Anderson, Sue Brennan, Catherine L Granger, Naomi Hammond, Sherene Magana Cruz, Jenna K Lang, Anne Leditschke, Neil R Orford, Selina M Parry, Bronwyn Price, Pam Taylor, Andrew A Udy and Sally E Green.

Background: The evidence base for research on physical rehabilitation and mobilisation in the intensive care unit has led to uncertainty about best practice.

Objective: The objective of this guideline was to develop evidence-based recommendations to support clinical decision-making for physical rehabilitation management of adults undergoing invasive mechanical ventilation in Australian intensive care units.

Methods: The guideline development group, comprising national representation of clinical experts, methodologists and consumers, followed a rigorous process, adhering to Australian National Health and Medical Research

Council (NHMRC) Guidelines for Guidelines, to create the recommendations. The guideline development group determined the scope of the guideline and defined the key clinical question. A systematic review was conducted to evaluate all available evidence based on the predefined outcomes. Meta-analyses were performed using a restricted maximum likelihood approach and results summarised in an evidence profile. The Grading of Recommendations Assessment, Development, and Evaluation (GRADE) methodology was applied to evaluate the certainty of evidence and GRADE Evidence to Decision Framework was used to formulate recommendations.

Summary of recommendations: Based on the evidence profile and GRADE Evidence to Decision Framework, the group developed three conditional recommendations and fourteen good clinical practice statements to guide practice. The guideline provides conditional recommendations in favour of undertaking physical rehabilitation and mobilisation in adults receiving invasive mechanical ventilation in the intensive care unit, whilst acknowledging the uncertainty of evidence. It was endorsed by four key professional organisations.

Conclusion: The recommendations within this guideline were developed following best methodological practice. Despite the overall low certainty of evidence, the resulting guideline provides support to clinical decision making, facilitates the translation of research into practice and enhances the reach and impact of clinical research. Additionally, the guideline development group identified evidence gaps that could be addressed by future research.

Alfred Research Alliance Consumer Involvement in Research Award

What Do People Want from an AI-Assisted Screening App for Sexually Transmitted Infection-Related Anogenital Lesions: A Discrete Choice Experiment

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Background: Melbourne Sexual Health Centre (MSHC) has developed an AI-assisted screening application called AiSTi for the detection of common STI-related anogenital skin conditions.

Aim: To understand the community's preference for using the AiSTi app.

Methods: We used a discrete choice experiment (DCE) to understand community preferences regarding the attributes of the AiSTi app for checking anogenital skin lesions. The DCE design included the attributes: data type; AI accuracy; verification of result by clinician; details of result; speed; professional support; and cost. The anonymous DCE survey was distributed between January and March 2024. Participant preferences on various app attributes were examined using random parameters logit (RPL) and latent class analysis (LCA) models.

Results: The median age of 411 participants was 32 years (interquartile range 26–40 years), with 64% assigned male at birth. Of the participants, 177 (43.1%) identified as same-sex attracted and 137 (33.3%) as heterosexual. In the RPL model, the most influential attribute was the cost of using the app (24.1%), followed by the clinician's verification of results (20.4%), the AI accuracy (19.5%) and the speed of receiving the result (19.1%). The LCA identified two distinct groups: 'all-rounders' (88%), who considered every attribute as important, and a 'cost-focused' group (12%), who mainly focused on the price. On the basis of the currently available app attributes, the predicted uptake was 72%. In the short term, improving AI accuracy to 80–89% with clinician verification at $5 could raise uptake to 90%. A long-term scenario with AI accuracy over 95%, no verification, and no cost could increase it to 95%.

Conclusion: Preferences for an AI-assisted screening app targeting STI-related anogenital skin lesions are for a low-cost, clinician-verified, highly accurate, and rapidly providing results. An app with these key qualities would substantially improve user uptake.

Alfred Research Alliance Consumer Involvement in Research Award

Creating a dementia eyecare pathway for residential aged care

Marianne Piano, Lynette Joubert, Lisa Keay, Anita Goh

Aim: 1) Understand how eyecare is delivered for people with dementia in residential aged care

2) Work with key stakeholders, including people with a living experience of dementia, to create a dementia eyecare pathway for residential aged care.

Methods: The following research activities are being undertaken, informed by an established implementation framework (Consolidated Framework for Implementation Research):

1) Observational case study in a residential aged care facility.
2) Auditing care plans to identify how information about resident eyecare needs is documented.
3) Documentary analysis of policies relating to meeting of eyecare needs in the facility, and wider policies in Australian dementia care.
4) Literature review of existing domiciliary eyecare models/interventions across the world

Findings will be reviewed by an expert reference group uniting hospital, community and long-term care perspectives on eyecare, and a project advisory group comprising people living with dementia and past/present carers. The draft pathway will be revised through two consultation rounds with the public, long-term care sector leaders, eyecare professionals and medical specialists (e.g. geriatricians, general practitioners).

Results: To date, 15 observation visits, lasting 2-6 hours, have been conducted. A variety of activities were observed: mealtimes, arts and crafts, socialising, intergenerational play, physical activity, resident meetings and an optometrist visit. Micro-interviews were conducted with care staff, lifestyle team members and visiting allied health professionals. A review of existing domiciliary eyecare models synthesised a number of recommendations of relevance to dementia-friendly eyecare. An article about eyecare in residential aged care was co-written with the project advisory group and published in the Australian Journal of Dementia Care.

Conclusion: Adopting a co-design approach, together with a recognised implementation framework, allows barriers to dementia eyecare pathway adoption/sustainment to be identified and addressed during design. If everyone with dementia receives regular eye tests and eyecare, they can see well, to live well.

Alfred Research Alliance Consumer Involvement in Research Award

Consensus palliative care referral criteria for people with idiopathic pulmonary fibrosis: An international Delphi study

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Introduction/Aim: People living with idiopathic pulmonary fibrosis (IPF) often experience rapid, unpredictable disease progression and high burden of distressing symptoms. When specialist palliative care is involved, people with IPF have better symptom management and longer median survival. Despite this, few people with IPF receive any specialist palliative care input. This study aims to establish consensus on criteria which would prompt a timely referral to specialist palliative care for people living with IPF.

Method: An international Delphi survey was conducted over three online surveys between April and July 2025 to identify consensus amongst expert clinicians and researchers regarding referral criteria for specialist palliative care for people living with IPF. Consensus was defined a priori as agreement of at least 70%. The project was overseen by a steering committee which included consumer representatives living with IPF. A focus group of people with lived experience of IPF or palliative care was conducted to provide feedback on the relevance and acceptability of the putative referral criteria.

Results: Up to 46 expert panellists participated in the Delphi. Panellists included physicians (78-83%) and nurses (15-20%) with specialist qualifications in respiratory (80-84%) or palliative medicine (31-35%). Consensus was reached on 17 major criteria and 40 minor criteria relating to 'hospital utilisation', 'respiratory therapies', 'symptom distress', 'comorbidities', 'exacerbation of IPF', 'time-based factors' and 'psychosocial factors'. Six people with lived experience broadly concurred with the agreement rates from the panellists, albeit often leaning towards earlier indicators than those which reached final consensus as major criteria.

Conclusion: These criteria support current clinical practice guidelines which emphasise comprehensive needs assessment and open communication between clinicians and patients. Future work is needed to examine the implementation of these criteria.

Grant Support: This study received funding from Monash University Faculty of Medicine, Nursing and Health Science Early Career Researcher Post-Doctoral Fellowship (AP).

Alfred Research Alliance Consumer Involvement in Research Award

The "HeartPath" program from pilot to clinical trial; co-designing a patient and family education and transition of care website.

Cartledge S, Beauchamp A, Tran A, Bratby K, Hennequin C, Nourse R, Ekegren C, Lui Y, Gauci S, Ball J, Driscoll A, Stub D

Background: Since 2016, in doctoral qualitative research conducted at Alfred Health, patients and families have described significant information deficits following a cardiac admission. They also find the transition from hospital to home and to cardiac rehabilitation (CR) very siloed.

Aim: To co-design and pilot a digital intervention providing education and transition of care support to cardiac patients diagnosed with acute coronary syndrome (ACS) and their families/carers.

Methods: Working with two consumer co-investigators (authors Bratby and Hennequin; one participated in the 2016 qualitative study) we undertook two rounds of experienced base co-design. The first round formed pilot data, the second included two key culturally and linguistically diverse populations (CALD; Chinese and Russian). Participants were recruited from the clinical (Alfred Health) and community settings. Data underwent thematic and framework analyses and guided digital intervention development. User testing of the pilot intervention was then conducted with a clinical population, and the system usability scale (SUS) was collected.

Results: The first pilot round of co-design recruited 16 participants (10 patients, six health care professionals across five co-design workshops); the second round recruited 49 patients/family (33 English speaking, 15 Chinese, 16 Russian across eight co-design workshops). CALD participants had additional information deficits, as well as misinformation and lack of CR referral. Participants identified they wanted a simple website. Key themes included illness experience (emotional factors, value of peer support); information (difficulty finding, absence of clear plan); the system (lack of patient empowerment, CR access challenges). Pilot website SUS scores were mixed (n = 10, median 65, range 60-92.5) – above average is considered >68.

Conclusion: We successfully co-designed and user-tested a pilot website. Valuable system usability feedback was collected. The pilot work led to a consumer-led MRFF grant that has allowed us to expand the co-design and to soon undertake an effectiveness/implementation study at Alfred Health.

Alfred Research Alliance Consumer Involvement in Research Award

Community Engagement in Maternal and Newborn Health Research: A Scoping Review of Research Guidelines in the Asia-Pacific

Warton C, Aguilera G, Dandona R, Quigley P, Leisher S, Homer CS.

Background: Community engagement is increasingly recognised as a crucial component of ethical and impactful health research, especially in diverse and complex settings such as maternal and newborn health research in the Asia-Pacific region. National health research guidelines set the requirements for the design, review and conduct of human health research. However, it is unclear what or how these guidelines support community engagement across countries in the Asia-Pacific.

Aim: To understand the current state of community engagement requirements in national research guidelines across countries in the Asia-Pacific region, particularly in relation to maternal and newborn health.

Methods: A Joanna Briggs Institute scoping review methodology was conducted in August 2025 across online, publicly available national research guidelines from countries in the Asia-Pacific region (region defined as WHO WPRO and SEARO countries). Guidelines from national government agencies that provided guidance on community engagement in human health research were included.

Results: Searches returned a total of 17 eligible documents from 12 of a total of 38 countries in the Asia-Pacific region. Most (n=16/17, 94.1%) documents included guidance on community engagement as part of a broader national research guideline. Only guideline (n=1/17, 5.9%) from Australia was dedicated solely to community engagement in health research. Community engagement was often recommended for specific populations, such as Aboriginal and Torres Strait Islander Australians or people with disabilities, rather than more broadly for human health research. No guidelines explicitly required engagement from people with lived experience. No guidelines explicitly recommended community engagement in maternal and newborn health research. Only one (n=1/17, 5.9%) document from Micronesia provided practical guidance to support researchers in identifying and including community members in their research.

Conclusion: Guidelines for community engagement are emerging in the Asia-Pacific region. However, comprehensive and practical guidance is limited, highlighting a need for clearer guidelines to standardise community engagement nationally.

Alfred Research Alliance Consumer Involvement in Research Award

A Co-Design Approach: Developing Effective Hepatitis-C Information, Education and Communication (IEC) Materials with People who Inject Drugs in Yangon, Myanmar

Su Naing MM, Htay H, Gibbs D, Stoové M, Pedrana A, Hellard M, Draper B, Adamson E

Background: Information and Education Communication (IEC) materials are crucial for promoting positive health-seeking behaviours. These materials often fail to resonate with people who inject drugs, so their impact is limited. While implementing hepatitis C virus (HCV) services for this group in Yangon, Myanmar, we observed that clients were hesitant to engage due to low awareness of HCV transmission and its treatments. We developed IEC materials to improve HCV awareness and boost service engagement among people who inject drugs.

Aim: To describe the process and impact of co-designing HCV-related IEC material with people who inject drugs in Yangon, Myanmar.

Methods: We conducted three workshops with people who inject drugs and healthcare providers in Yangon in 2024, focused on identifying key health messages and preferred material types, and collaboratively reviewed and refined draft designs. We then surveyed 109 participants to evaluate the effectiveness of the final materials.

Results: Co-design workshops successfully led to the creation of posters, flyers, and stickers with key messages on HCV transmission, treatment, and curability, as well as the importance of early testing and treatment to prevent severe health consequences. By creating an inclusive environment and keeping sessions concise to maintain engagement, the co-design process enabled a deeper understanding of participants' knowledge, attitudes, and motivations surrounding HCV. Our evaluation survey revealed overwhelmingly positive results, with 97% of participants agreeing that materials improved their understanding of HCV. The materials motivated behavioural change, with over 80% referring friends for testing, 65% discussing HCV with friends or family, and 42% getting tested.

Conclusion: Our project confirms that a participatory approach is essential for creating impactful HCV health campaigns. IEC materials were well-received and empowered individuals to take positive health actions and engage with services, highlighting the importance of incorporating community voices in designing materials that resonate and drive behavioural change.

Disclosure of Interest Statement:

This research was supported by the Burnet Institute and the Australian Government through a DFAT-funded ANCP project. The authors declare that there are no conflicts of interest regarding the publication of this material.

Alfred Research Alliance Consumer Involvement in Research Award

From Barriers to Bridges: Transforming Healthcare Communication Through Co-Development with Key Stakeholders

Chappel S.E, Ozavci G, McDonald C, Wallace S, Dahm M, Brough R, Redley B, Nouman M, Bucknall T

Poor communication is the most common cause of adverse events, or mistakes, occurring in healthcare environments. Effective communication between consumers and healthcare professionals (HPs) is vital for ensuring high-quality and equitable patient-centred care. Researchers and consumers collaborated to develop the CONVEY project. An Expert Advisory Group (EAG), comprising four lived experience consumers of diverse backgrounds and eight Alfred Health (AH) executive and operational leaders, was formed to support, review, advise, and identify priority interventions to improve clinical communication for implementation across AH.

Aim: To understand the barriers, facilitators and opportunities for improving clinical communication experienced by patients, families, and HPs at AH to inform co-development of priority interventions.

Methods: Using a qualitative design, 29 consumers (15 patients and 14 families) and 15 HPs (5 medical, 5 nursing, and 5 allied health staff), were interviewed (April-July 2025). Recruitment captured diversity across ages, genders, cultural backgrounds and programs. Interview questions were designed with consumers. Inductive reflective thematic analysis identified themes that were discussed with the research team and EAG to ensure credibility and relevance.

Results: Ten major themes were identified relating to clinical communication: Modes and access; Culture and language; Timing and consistency; Roles and responsibilities; Communication content; Patient and family involvement; Communication barriers; Communication skills and tools; Challenges in practice; Documentation and information management. The EAG consumers found the themes represented their own communication experiences and improvement ideas.

Conclusion: Partnering with consumers in the design and conduct of the study promoted true collaboration. Consumers were empowered as team members to share their ideas, prioritise themes and create implementation plans. While the study highlighted nuanced experiences of barriers and facilitators to effective clinical communication from diverse consumer participants, the collaboration ensured fit-for-purpose research for AH consumers and staff. Findings will inform the co-development of a strategy to address deficiencies and improve communication.

Alfred Research Alliance Consumer Involvement in Research Award

What Now? Identifying survivorship needs for Cancer Patients in Their 20s and 30s

Nicole Jackson, Matthew Brown, Diana Gee, Erica Patterson, Marina Nguyen, Simone Waterman

Aim: Cancer survivorship care presents unique challenges for young adults in their 20s and 30s. This critical stage in the life course is often overlooked in existing Adolescent and Young Adult (AYA) care frameworks, which traditionally focus on those aged 15-25. This project aims to identify the specific survivorship needs of young adults with cancer through consumer-driven co-design, ensuring their voices shape the development of tailored, age-appropriate care programs.

Methods: An exploratory qualitative research approach was used, involving two focus groups—one with young adult cancer patients (n=8), one with healthcare professionals (HCPs) (n=10) from Alfred Health. The sessions were delivered in hybrid format, allowing for in-person and online participation. Insights from the patient focus group informed the design of a semi-structured survey, which was distributed to a broader cohort of young adult patients (n=299). Data analysis combined deductive and inductive coding (aligned with focus group prompts) to identify emergent themes. Two young adult consumers with lived experience actively participated in all stages of the research project to ensure it is tailored to real-world priorities, meaningful outcomes and better knowledge translation.

Results:

Thematic analysis highlighted four key themes:

1. Holistic Care Needs – Desire for tailored mental health support, peer connection, age-appropriate services and programs that address lifestyle modification and wellbeing.
2. Post-Treatment Void – A gap in support following treatment completion. Return to work/study challenges.
3. Fragmented Care – Poor coordination and communication between providers. Lack of awareness of services.
4. Financial Struggles – Significant concerns relate to cost of treatment, travel, and income loss.

Conclusion: This project underscores the value of meaningful consumer involvement in identifying unmet needs and co-designing meaningful services. Findings are now informing the development of targeted, person-centred survivorship initiatives within the Integrative Oncology Unit, ensuring care reflects the lived experience of young adults living with and beyond cancer.

Alfred Research Alliance Consumer Involvement in Research Award

Measuring Outcomes Beyond Disease (MOBY-D): Incorporating Patient Reported Outcomes in Epilepsy Care Through a Consumer Co-Designed Approach

Foster E, Conquest A, Walker M, Gurkan M, Stapleton C, Conoley B, Neal A, Kwan P, O'Brien TJ, Simpson H, Kaul N

Patient reported outcome measures (PROMs) are brief, patient-completed questionnaires that can inform clinical-decision making, drive quality improvement, and help deliver value-based healthcare. International guidelines recommend their routine use in clinical practice.

Aim: To assess the feasibility and acceptability of implementing PROMs as part of routine clinical practice in the Alfred Epilepsy Outpatient Service.

Methods: This was a prospective observational study. The research team included two people with lived epilepsy experience who were involved at each stage of the study, including protocol development and co-chairing a consumer focus group. Researchers identified a secure, fully digital pathway for sending and receiving PROMs via Cerner and the Patient Portal and confirmed its feasibility via a pilot study. Epilepsy clinicians attended two in-person information sessions regarding accessing the PROMs in Cerner and received one-on-one demonstrations at the start of each clinic as the study began. Recruitment occurred between May-July 2025 (supported phase) and Aug-Sept 2025 (unsupported phase). In the supported phase, patients were invited via telephone call and email to complete PROMs several days prior to their clinic appointment. Clinicians were also emailed reminders to check PROMs prior to each clinic. During the unsupported phase, patients were emailed PROMs invitations but did not receive telephone calls, and clinicians were not reminded to check PROMs. Outcomes were PROMs completion rates, and data from a patient focus group and feasibility/acceptability questionnaires.

Results: 41/44 (93.2%) patients completed PROMs in the supported phase, and 9/44 (20.5%) in the unsupported phase. PROMs were acceptable (83%) and easy to complete (65%) for the majority of patients. Clinicians (n=10) found PROMs straightforward to review (100%), beneficial to care (78%), and did not interfere with workflow (67%). Patient and clinician feedback emphasised the importance of epilepsy-specific PROMs.
Conclusion: PROMs were acceptable, but their completion rate relied on close support from the research team.

Alfred Research Alliance Consumer Involvement in Research Award

Linking Brain and Heart in Rare Diseases: A Consumer-Driven Stem Cell Approach to Precision Medicine

Muhammad Shahid Javaid, Terence O'Brien, Ben Rollo, Patrick Kwan, Ana Antonic-Baker

Introduction: Rare diseases, such as HOMER1-related disorders, often remain under-recognised, leaving families with few treatment options. Patients experience seizures alongside cardiac complications such as arrhythmias, underscoring the critical brain–heart connection mediated by calcium signalling. Addressing both systems together is essential to developing effective therapies.

Aim: This project aims to create personalized translational models of HOMER1-related rare disease to identify repurposed FDA-approved drugs that target both neurological and cardiac symptoms, guided by active consumer and carer involvement.

Hypothesis: We hypothesise that calcium signalling disruptions underlie both seizure activity in neurons and arrhythmias in cardiac cells, and that testing drugs on patient-derived cells will reveal personalized therapeutic options for "n-of-1" clinical trials.

Methodology: The patient-derived induced pluripotent stem cells (iPSCs) differentiated into functional neurons and beating cardiomyocytes. Using multi-electrode array (MEA) and calcium imaging platforms, we assessed baseline activity, abnormal excitability, and calcium flux. FDA-approved compounds were systematically tested for their potential to restore normal activity. Carers and patients helped co-design study priorities to align with lived experiences.

Results: Patient-derived neurons displayed seizure-like hyperexcitability, while cardiomyocytes revealed irregular calcium handling consistent with arrhythmias. Drug responses varied across the patient and control cell models, demonstrating the importance of personalized testing. Several compounds reduced abnormal activity in both neuronal and cardiac models, highlighting potential dual-action therapies.

Conclusion: This project provides a consumer-driven framework for precision medicine in rare diseases. By integrating patient voices, linking brain and heart biology, and repurposing existing drugs, we move towards tailored "n-of-1" therapeutic strategies. Importantly, this study demonstrates how genuine consumer involvement can guide meaningful research outcomes, address long-neglected rare conditions and offer hope to families living with both seizures and arrhythmias.

Alfred Research Alliance Consumer Involvement in Research Award

Establishing Quality Indicators for Moderate to Severe Traumatic Brain Injury: Insights from Australian Traumatic Brain Injury National Data Project

Kang JH, Solly E, Rushworth N, Fernon D, Kim Y, O'Reilly GM

Moderate to severe traumatic brain injury (msTBI) is a heterogeneous and devastating disease associated with high mortality and lifelong disabilities, affecting more than one third of severely injured patients in Australia. It also poses a significant public health burden, with an estimated annual cost of 2 billion AUD. While multiple studies have developed quality indicators for clinical management, there has been less focus on assessing and understanding the quality of care from the consumer's perspective.

The present study, as a part of the Australian Traumatic Brain Injury National Data Project (ATBIND), aimed to establish quality indicators for patients with msTBI. The study participants included individuals with lived experience of msTBI, including people who received acute care for msTBI and/or their family or informal carers. These volunteers participated in semi-structured interviews after providing informed consent. All interviews were transcribed and grounded theory was employed for thematic coding analysis that led to the identification of three major quality of care themes: 1) Communication and compassion; 2) Perceptions of clinical care and outcomes; and 3) Rights and responsibilities. Our preliminary data suggests the hierarchy of these three core categories could help to identify areas for improvement in perceived TBI care throughout the patient journey. It will also provide a functional tool to compare TBI care delivery across various settings (i.e. metropolitan vs regional) and develop co-designed care pathways, partnering with consumers.

Alfred Research Alliance - Aboriginal and Torres Strait Islander Peoples' Research

Every Yarn Counts: Reaching clients of Aboriginal Community Controlled Health Organisations with a destigmatizing hepatitis C health promotion campaign

Gibbs, D, Christensen, S, Adamson, E, Mercer, D, Goodwin, T, Hellard, M, Combo, T, Pedrana, A

Background: Aboriginal and Torres Strait Islander people are at increased risk of hepatitis C virus (HCV). Every Yarn Counts (EYC) is a national HCV health promotion campaign co-designed with representatives from Aboriginal Community Controlled Health Organisations (ACCHOs). The 3-month campaign was implemented in nine ACCHOs Australia-wide, and included destigmatizing messages, merchandise, financial incentives for HCV testing and treatment, and education for ACCHO staff. The campaign aimed to reduce stigma and shame around HCV and reduce HCV infection in Aboriginal and Torres Strait Islander communities.

Aim: To evaluate how the campaign supported ACCHOs to engage Aboriginal and Torres Strait Islander communities in HCV care by reducing stigma, normalising HCV conversations, and empowering staff to deliver care.

Methods: The mixed methods evaluation included service-level HCV testing and treatment data (three months; six sites), client surveys assessing campaign exposure and response (n=112; seven sites) and staff focus groups assessing implementation fidelity and strategies driving success (n=8 sites).

Results: Clinical data from six sites indicated that 749 people tested for HCV during the campaign, 15/749 (2%) received a positive RNA result, of whom 13 were referred into treatment. 82% of clients surveyed reported seeing EYC promotional material, with most respondents indicating that the campaign made them comfortable talking about HCV (85%) and made them want to know more about HCV (76%). Staff identified campaign merchandise as effective for initiating HCV conversations, however financial incentives were most effective for engaging clients in testing.

Conclusions: This work demonstrates the importance of positive messaging and talking about HCV in community to reduce HCV-related stigma and shame. EYC helped clients to engage in conversations about HCV with ACCHO staff, leading to high HCV testing. However, the low RNA-positivity indicates the campaign did not reach those most at-risk. Future campaigns should focus on how to reach this group.

Disclosure of Interest Statement: AP have received investigator-initiated research funding from Gilead Sciences and AbbVie and consultant fees from Gilead Sciences for activities unrelated to this work. TC receives honorarium payments from Astra Zeneca Australia for activities unrelated to this work.

Alfred Research Alliance - Aboriginal and Torres Strait Islander Peoples' Research

A Support model to change staff and artist outcomes at The Torch

Author names: Amy Kirwan, Shelley Walker, Emily Adamson, Troy Combo

The Torch is a First Nations led and run organisation that works to reconnect people through providing art, cultural and arts industry support to First Nations people who are or have been incarcerated.

Aim:

Burnet were approached by The Torch to:

- Better understand the support needs of the Torch staff and First Nations artists (program participants)
- Identify challenges experienced in the program both in prisons and in the community
- Co-design a better organisational support model to prevent staff feeling unsupported or ineffective in their roles and to prevent artists disengaging from the program

Methods: Semi-structured qualitative interviews (n=22) were conducted with Torch staff and artists to understand experiences and perspectives of the program, including best things and challenges, suggested solutions and dreams for the future. Five generative and iterative co-design workshops were held to build a series of tools and resources for the organisation, utilising the Aboriginal 8 Ways Pedagogy and culturally appropriate creative and artistic methods.

Findings: The organisation will benefit from recruiting a social worker to advise staff on how best to meet the health and social needs of artists, and to support referrals by developing a structured process, a directory of connected services and a roadmap for future partnerships. Additionally, the creation of an accessible written resource for artists entering the program will enable realistic expectations and shared understanding of the organisation's role and encourage artists to engage in dialogue about what they hope to gain from joining the program. A system for staff to effectively manage critical incidents that supports culturally safe and appropriate responses will support the safety and wellbeing of all staff and artists. Prototypes for each of these resources and tools were developed via a co-design process and synthesised by the research team for delivery back to the organisation for future implementation.

Alfred Health Medical Staff Clinical Research – Junior Medical Researcher

The impact of multidisciplinary team meeting in management of patients with cardiac sarcoidosis: Experience from a state-wide heart transplant service

Dr. Simon Zhang; Dr. Dana Lee; Dr. Jacinta Cheng; A/Prof James Hare; Dr. Sarah Gutman; Dr. Kenneth Yap;
Dr. Davina Bates; Dr. Jyotika Prasad; Prof Flavia Cicuttini; Dr. Yuan Lim

Cardiac sarcoidosis (CS) is a serious manifestations of systemic sarcoidosis posing significant diagnostic and therapeutic challenges. Patients with suspected or confirmed CS are referred to Alfred Health, a state-wide heart transplant centre, for diagnostic work-up, management and assessment for transplantation candidacy. To guide these complex management decisions, we established a multidisciplinary meeting (MDM) involving rheumatology, cardiology, nuclear medicine, respiratory and pathology specialists.

Aim: To evaluate the impact of the CS-MDM on patient management and outcomes.

Methods: We conducted a retrospective review of all patients discussed at the CS-MDM from its inception (14 July 2023) to 1 January 2025. Data including patient demographics, clinical presentation, imaging and histology findings, organ involvement, and management decisions were extracted from electronic medical records.

Results: A total of 24 patients (mean age 52.5; male 83.3%) were discussed. The most common presentations were arrythmias (13/24 [54.2%]), dyspnoea or cough (6/24 [25.0%]) and chest pain (5/24 [20.8%]). All patients had positive cardiac magnetic resonant imaging and positron emission tomography findings, and 20/24 (83.3%) had histological evidence. Most patients had extra-cardiac manifestations (23/24 [95.8%]): nodal (21/24 [87.5%]); pulmonary (14/24 [58.3%]); splenic (4/24 [16.7%]); haematological (4/24 [16.7%]); hepatic (3/24 [12.5%]) and ophthalmic (1/24 [4.2%]). Eight patients (33.3%) were discussed for diagnostic purposes, resulting in a change of diagnosis in 5 cases (5/8 [62.5%]). All patients were discussed for management purposes, with changes to immunosuppression regimen in 20 patients (83.3%): escalation in 8/20 (40%) and de-escalation in 8/20 (40%) patients. Two patients proceeded to heart transplantation due to refractory malignant arrythmias, while the remainder achieved improvement or stabilisation of disease, avoiding need for heart transplantation consideration.

Conclusion: The CS-MDM led to changes in immunosuppressant therapy in most patients, resulting in improved or stabilised clinical outcomes. Managing CS patients in a multidisciplinary setting has a direct beneficial impact on patient care.

Alfred Health Medical Staff Clinical Research – Junior Medical Researcher

Incidence, predictors and outcomes of stroke following transcatheter aortic valve implantation – A multicentre contemporary Australian experience

Butala A[1], Nanayakkara S, Palmer S, Noaman S, Guiney L, Htun NM, Walton A, Stub D

Background: Stroke is one of the most serious complications following TAVI, associated with increased disability and mortality. Despite this, there is a lack of patient-level data examining stroke in contemporary, lower-risk TAVI populations. In particular, there are no Australian studies exploring this issue. There is also limited literature that explores the temporal evolution in stroke-incidence among real-world cohorts.

Aims: We aimed to assess the incidence, predictors and outcomes of stroke in a modern group of TAVI patients across the clinical risk spectrum.

Methods: Retrospective analysis of prospectively collected data since 2015 included in the largest multi-centre TAVI registry in Australia. Stroke and other outcome measures were defined in accordance with the Valve Academic Research Consortium-3 guidelines.

Results: Of 2236 patients, median age 83 (IQR: 78, 87), 42% female and median STS score 3.6 (2.3, 5.6), 46 (2.1%) patients experienced a stroke within 30-days of TAVI. Stroke incidence did not reduce across the study period (2015–2017: 1.1% vs 2018–2020: 2.0% vs 2021 onwards: 2.5%, P_{trend}=0.315). Independent predictors of 30-day stroke were prior radiotherapy (adjusted odds ratio [aOR] = 2.7, p=0.041), non-femoral access (aOR 4.0, p=0.033), new-onset atrial fibrillation (aOR 4.6, p=0.020), and mild or greater para-valvular regurgitation (aOR 2.2, p=0.009). Post-TAVI stroke was the strongest predictor of 30-day all-cause mortality in multivariable analysis (aOR 15.1, p<0.001).

Conclusion: Stroke remains a common TAVI complication in contemporary practice patients. Despite demographic and procedural evolution, there was no reduction in stroke incidence across the study-period. Further research investigating novel strategies for stroke prevention is required.

Alfred Health Medical Staff Clinical Research – Junior Medical Researcher

Cost-Consequence Analysis of the Introduction of a Traumageriatric Service

Philip Belleville, Margot Lodge, Lidia Engel, Seema Parikh, Eva Kipen, Paul Barfett, Joseph Mathew, Peter Hunter, Belinda Gabbe, Chris Moran

Background: Older people experiencing traumatic injury experience poorer outcomes leading to higher healthcare utilisation and, in turn, increased healthcare costs. Geriatrician-led models of older persons' trauma care are specifically designed to manage these care needs and improve outcomes for patients and hospitals.

Aim: To evaluate the costs and consequences of implementing a comprehensive geriatric assessment-based traumageriatric Service (TGS) into a large, metropolitan Melbourne hospital.

Methods: A TGS, comprising 0.5 full-time equivalent (FTE) geriatrician, 1.0 FTE advanced physician trainee, 1.0 FTE basic physician trainee was introduced on 6 February 2023, reviewing all patients admitted to the Trauma service over 65 years of age with a Clinical Frailty Scale (CFS) ≥5 and/or delirium. I used routinely collected health service and Victorian State Trauma Registry data to compare economic costs and consequences associated with people admitted in the 12 months prior to the introduction of TGS (who would have been eligible for the service) to those who were seen 12 months after introduction.

Results: Data were available for 463 people pre-intervention and 489 post-interventions. Patient characteristics were similar prior to and following TGS introduction (mean age 83 vs 85 years, 54% vs 55% female, mean CFS 5 in both groups). The salary cost of providing TGS over the measurement period was $443,762. The median per-patient revenue was lower after TGS ($15517) than prior ($18997, $p<0.01$). The median per-patient expenses were lower post-TGS ($25396) than pre-TGS ($32368, $p<0.01$). The median length of acute hospital stay was lower following TGS introduction (10 days) than prior (8 days, $p<0.01$).

Conclusion: Patients seen by a TGS had lower net financial loss per patient and lower length of stay than those eligible for the service in the year prior to introduction. This suggests a strong business case for continuation and replication.

Alfred Health Medical Staff Clinical Research – Junior Medical Researcher

Understanding the epidemiology, clinical characteristics and infection severity of mpox cases in 2024 outbreaks in Victoria, Australia

Aung ET, Low SJ, Towns J, Fairley CK, Lim CK, Chow EPF

Following the global mpox outbreak in 2022, clusters of clades II mpox cases have continued to emerge in 2024 in many countries, including Australia.

Aim: To understand the epidemiology, characteristics, and severity of mpox cases presented to a public sexual health clinic in Victoria during the 2024 outbreaks.

Methods: We conducted a retrospective cross-sectional study of mpox-confirmed cases using mpox polymerase chain reaction test at the Melbourne Sexual Health Centre, Australia between January and September 2024. We collected data on demographic characteristics, sexual behavioural data, and vaccination history, clinical characteristics, and infection severity. We examined the factors associated with mpox clinical severity (mild, moderate, severe) using ordered logistic regression.

Results: We included 156 mpox confirmed cases (155 men and 1 woman) with the median age of 35 (IQR: 31-40), and most were MSM (98%, n=153). More than half (59%, n=91) had at least one mpox vaccine. Mpox vaccination was highest in PrEP users (74%, n=67), followed by persons living with HIV (PLHIV) (19%, n=17), and HIV-negative non-PrEP users (8%, n=7). One person had a previous mpox infection in 2022.

Most (94%, n=147) had mild or moderate symptoms, and 5% (n=8) had severe symptoms requiring hospitalisations. One was lost to follow-up. The median of lesions per case was 3 (IQR: 1-9). Vaccinated group (n=91) had lower odds of severe disease than unvaccinated group (n=64) (odds ratio [OR]: 0.32, 95%confidence interval [CI]:0.15-0.67, p=0.002). An increase in the number of lesions was associated with more severe disease (OR: 1.07, 95% CI: 1.01-1.13, p=0.02). PrEP use, HIV status, and age were not associated with clinical severity.

Conclusion: Our findings suggest mpox vaccination reduces disease severity. However, the notable number of unvaccinated PLHIV and non-PrEP users highlighted the need for increased awareness and public health campaigns to boost vaccine uptake among MSM to protect the community.

Alfred Health Medical Staff Clinical Research – Junior Medical Researcher

Medium Term Effects of High Dose Ionising Radiation Procesures in Interventional Radiology

Catherine Guo, Zoe Brady, Kyle Ewert, Helen Kavnoudias, Gerard S Goh

Introduction: The internationally recognised lower threshold for ionising radiation-induced skin effects, such as erythema and epilation, is 2 gray (Gy) (1) for a 1% incidence rate. This retrospective study aimed to investigate the incidence of skin effects following high dose angiography procedures at Alfred Health.

Method: After ethics approval, data was retrospectively collected for patients who underwent a procedure in any of the two dedicated angiography suites or three fluoroscopy rooms from 1 January to 31 December 2023. Those with a recorded machine-displayed air kerma value of >3 Gy from a single procedure were identified and contacted by an interventional radiology consultant to consent and participate in the study using a standardised telephone questionnaire approved by the Patient Experience and Consumer team. If any patients reported a skin effect during interview, the medical physicist would then calculate a peak skin dose and the state regulator would be informed.

Results: Out of 5791 procedures performed, 34 patients were identified to have a recorded machine-displayed air kerma value of >3 Gy from a single procedure. Of these, four patients were uncontactable, and four patients were deceased at time of contact (approximately 5-10 months [IQR] post-procedure). 26 patients participated in this study. The mean air kerma of these patients was 3.9 Gy (standard deviation (SD) 0.9 Gy), and median 3.7 Gy (IQR 3.2-4.5 Gy, maximum 6.3 Gy). No patients reported erythema, and one patient reported epilation and other skin effect(s), which after face-to-face patient consultation were deemed unrelated to the radiation procedure.

Conclusion: There were no patients identified to have skin effects caused by a high dose interventional procedure (>3 Gy) across a one-year period. Further prospective research is recommended to follow up patients to better identify potential skin effects and allow for changes to local guidelines to best support patients' post-procedure.

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Alfred Health Medical Staff Clinical Research – Junior Medical Researcher

The feasibility, patient acceptability and effectiveness of a new model of care for patients with gout and co-morbidities

Ryan Moore, Yuan Lim, Jacinta Cheng, Flavia Cicuttini

Objective: Despite the availability of simple and effective therapies, management of gout remains poor, resulting in pain and disability and increased healthcare costs. At the Alfred Hospital, an acute gout flare adds $8000 to a multi-stay admission. Treating to a target serum uric acid level reduces acute gout flares and long-term disability but can be difficult to achieve due to the need for multiple patient appointments. Our aim was to determine the efficacy and patient acceptability of a telephone-based model of gout care.

Methods: Consecutive patients referred to the rheumatology unit and assessed as needing uric acid lowering treatment were offered management in a telephone-based clinic. Follow up was 4-6 weekly. Up-titration of gout medications and prevention and management of any gout flares were undertaken by resident medical staff.

Results: Of 97 eligible patients, 76 (78%) participated (age 64.4+/- 12.9 years; 88.5% male; mean body mass index 29.5, 7.7%). All had co-morbidities: chronic renal disease (56.4%); ischaemic heart disease (21.8%), diabetes (21.8%), stroke (11.5%). Target uric acid was achieved at 6 months in 62 patients (85%), with a median of 4 contacts (range 2-7) and 57 of 63 (95%) followed for ≥12 months, median 4 contacts (range 3-9). Allopurinol was used in 74 (95%) (median dose 300mg, range 100mg-700mg). Two patients with recurrent gout flares were transferred to main clinic for further management. More than 95% of patients were very satisfied with the service. Initial appointment was on average 15-20 minutes while review appointments were approximately 10 minutes.

Conclusion: A telephone-based approach is an effective, low-cost way to manage gout in patients with co-morbidities, with very high patient acceptability and satisfaction.

Alfred Health Medical Staff Clinical Research – Junior Medical Researcher

Perturbations in the Microbial Derived Metabolites Underlie Acute Graft-Versus-Host Disease

JLC Tan, TW Khong, S Byars, K Jeppe, C Barlow, S Mithraprabhu, A Spencer

Introduction: Acute graft-versus-host disease (aGVHD) is a serious inflammatory complication affecting 20–50% of allogeneic stem cell transplant (alloSCT) recipients, arising when donor immune cells attack host tissues. Increasing evidence implicates the intestinal microbiota in shaping immune homeostasis and driving aGVHD pathogenesis. To investigate this further, we analysed the serum metabolome of alloSCT recipients to identify aGVHD unique metabolic signatures.

Methods: Serum samples were collected from alloSCT patients at aGVHD onset (prior to treatment) and from alloSCT controls at day 100 post-transplant. Untargeted metabolomic profiling was performed using high-performance liquid chromatography–mass spectrometry. Quantitative enrichment analysis, performed using the MetaboAnalyst v6.0 platform, was used to identify key metabolic categories altered in patients with aGVHD.

Results: A total of 82 patients (31 with aGVHD, 51 controls) and ~1,400 metabolites were analysed. The median age was 60 years old (range: 18 – 74 years). The majority received a transplant from a matched unrelated donor (42.6%), followed by matched sibling (27.7%) and haploidentical donor (29.7%). Pathway enrichment analysis revealed significant alterations in tyrosine and tryptophan metabolism, both closely linked to intestinal microbiota activity for their absorption and processing. Downstream tyrosine metabolites were consistently reduced in aGVHD patients, including dopaquinone (fold change [FC] 0.65, p=0.005), 2-hydroxy-3-(4-hydroxyphenyl)propenoic acid (FC 0.56, p<0.001), leucodopachrome (FC 0.36, p=0.002), and 3,4-dihydroxybenzeneacetic acid (FC 0.60, p=0.002). Tryptophan pathway metabolites were also decreased, notably indole-3-acetate (FC 0.56, p=0.005) and acetyl-N-formyl-5-methoxykynurenamine (FC 0.64, p=0.04). Several other microbiota-derived metabolites were perturbed, including phenol sulphate (FC 0.63, p=0.001), thymyl acetate (FC 0.76, p=0.03), and phenylacetylglutamine (FC 0.53, p=0.001). These differences did not vary by aGVHD organ involvement.

Conclusion: Our analysis reveals an association between the development of aGVHD and metabolic pathways involving the host-microbiota interface. These findings support further investigation of host-microbial metabolic pathways as potential biomarkers and therapeutic targets for aGVHD prevention and treatment.

Alfred Health Medical Staff Clinical Research – Junior Medical Researcher

External telemetry device application among patients of differing ages, NIHSS score, and cultural backgrounds

Esme Muller, Estelle Hamson, Geoffrey Cloud

Background/Aims: The use of an external telemetry device (ETD) to detect paroxysmal atrial fibrillation (pAF) is a key investigation following an Embolic Stroke of Unknown Source (ESUS). However, not all ESUS patients are fitted with an ETD. Effectively operating an ETD requires both physical capacity and technological literacy. This study aims to investigate differences in the rate of ETD use amongst patients of differing ages, National Institutes of Health Stroke Scale (NIHSS) scores, and culturally and linguistically diverse (CALD) backgrounds.

Method: This was a single centre, retrospective study of inpatients at a comprehensive stroke centre with confirmed ESUS between January 2023 and December 2024. Data were analysed using descriptive statistics and inferential testing as appropriate.

Results: 229/621 (37%) ischaemic stroke patients met diagnostic criteria for ESUS. Of these, 95/229 (41%) were fitted with an EDT. A total of 21 patients identified as CALD. The median age of patients fitted with an ETD was significantly lower than those not fitted with an ETD (63 vs 75, $p<0.01$). The NIHSS scores were significantly lower in patients fitted with an ETD, compared to those who were not (2 vs 3.5, $p<0.01$). CALD patients were significantly less likely to receive an ETD compared to non-CALD patients (10% vs 45%, $p<0.01$).

Conclusion: Older patients, CALD patients and those with higher NIHSS are less likely to receive ETDs. This may have implications for detection of pAF in these populations. Further efforts are required to characterise the barriers to ETDs and improve accessibility.

Alfred Health Medical Staff Clinical Research – Junior Medical Researcher

A Retrospective Study of the Use of the Emergency Department Fractured Neck of Femur Pathway in the Royal Hobart Hospital

Riana Samuel John, Blair Adamczewski

Background: Worldwide, it is estimated that there will be up to 6.3 million hip fractures per year by the year 2050[1-2]. Pain management in the elderly is difficult due to comorbidities and increased medication side effects[3]. Regional nerve blocks may offer an alternative form of analgesia to improve post operative outcomes.

Aim: The primary aim is to investigate the utilisation of regional nerve blocks at the Royal Hobart Hospital Emergency Department before and after the implementation of the Emergency Department Fractured Neck of Femur (NOF) Pathway. The secondary aims include assessing differences in mobility and pain scores between pre- and post-intervention groups. Other secondary aims include assessing for a difference in the administration of regional nerve blocks between those who had cognitive impairment and/or delirium, compared to those without.

Methods: The Fractured NOF Pathway was commenced on 1st July 2019 in the Royal Hobart Hospital Emergency Department. Patient data was obtained from 1st January 2017 to 31st December 2021.

Results: There were 186 patients in the pre-intervention group and 182 patients in the post-intervention group. 147 participants in the pre-intervention group had a nerve block performed, compared to 153 in the post-intervention group (P value 0.214). Notably, there were significantly increased femoral nerve blocks in the pre-intervention group and significantly increased fascia iliac blocks in the post-intervention group (P value <0.0001). No significant differences were noted between intervention groups with regards to secondary end-points.

Conclusion: The rates of nerve block administration was high at 79% in the pre-intervention group and this saw a further small, but not statistically significant increase (to 84%) following the roll out of the Fractured NOF Pathway. Ongoing work is still required to increase the rate of nerve block administration further for patients with neck of femur fractures.

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Alfred Health Medical Staff Clinical Research – Junior Medical Researcher

Long Term Outcomes Post Ablation in Patients with Heart Failure with Reduced Ejection Fraction

Kenneth Cho, Sandeep Prabhu, Louise Segan, Jeremy William, Rose Crowley, Nicholas D'Elia, David Chieng, Hariharan Sugumar, Liang-Han Ling, Aleksandr Voskoboinik, Joseph B Morton, Geoffrey Lee, Alex J McLellan, Justin Lineham, Matthew Morton, Sonia Azzopardi, Annie Curtin, Michael W Lim, Youlin Koh, Michael Wong, Jonathan M Kalman, Peter M Kistler

Background: Heart failure with reduced ejection fraction (HFrEF) in the presence of atrial fibrillation (AF) is common, with concerns AF recurrence will precipitate acute decompensation. However, the impact of AF recurrence following catheter ablation (CA) on HF is not well understood. We sought to examine the clinical outcomes and hospitalisation patterns in AF HFrEF patients following CA.

Methods: This multicentre study reports the clinical and re-admission outcomes for patients with AF and HFrEF (LVEF≤40%) following CA.

Results: 231 patients (60.5±11.1years, 37 females, mean LVEF 30.7±7.1%, persistent AF 87.9%) with AF and HFrEF underwent CA. At 3.0 years follow-up, recurrent AF occurred in 120 (51.9%) and complete LV systolic recovery (LVEF≥50%) in 125 (54%) patients. Late mortality occurring remote to the index ablation procedure occurred in 5 patients at a mean of 2.7±2.2years post-ablation. These were due to sudden cardiac death (n=1), heart failure in the setting of severe LV dysfunction in sinus rhythm prior to AF diagnosis (n=2), trauma (n=1), and malignancy (n=1). There were 366 hospitalisations amongst 123 patients: 240 cardiac and 126 non-cardiac. Arrhythmia related hospitalisations occurred in 179: 151 recurrent atrial arrhythmia without HF, 4 AF with HF, 3 supraventricular tachycardia and 21 ventricular arrhythmia. Other cardiac hospitalisations (61) included: HF without AF recurrence (24), cardiac device insertions (24), ischemic heart disease (8), pericarditis (3) and cardiac valvular surgery (2). On univariable analysis, the absence of LVEF recovery post ablation (OR=1.32, 95% CI=1.11-12.55 P=0.03), persistent AF versus paroxysmal AF recurrence (OR=1.76, 95% CI=1.21-27.72 P=0.03), ischemic cardiomyopathy (OR=3.62, 95% CI=1.16-11.30 P=0.02), and furosemide use (OR=4.96, 95% CI=1.55-15.91 P<0.01) were associated with future HF hospitalisation.

Conclusion: After catheter ablation, it is uncommon for patients with AF and HFrEF to present with recurrent AF and HF, but more commonly present with HF without AF, or AF without HF.

Alfred Health Medical Staff Clinical Research – Junior Medical Researcher

A Review of Middle Meningeal Artery Embolization Among Patients with Non-Acute Subdural Haematoma at a Major Trauma Centre in Australia

Prasanthan Thaveenthiran, Peter Shuangyue, Winston Chong, Carlos Chung, Cameron Williams, Steven Bush, Jithoo Rondhir, Connor Houlihan, Anoop Madan

Aim: To retrospectively review patients with non-acute subdural haematoma who underwent MMA embolization to evaluate the recurrence and adverse events.

Background: Non-acute subdural haematoma (SDH) is increasingly encountered in the elderly population, particularly in those on antiplatelet or anticoagulant therapy. Despite surgical evacuation, recurrence rates remain high, and perioperative risks are significant. Middle meningeal artery (MMA) embolization has emerged as a promising adjunct or alternative therapy. Recent trials such as STEM, EMBOLISE, and MAGIC-MT support its role in reducing recurrence and surgical intervention. We present our institutional experience with MMA embolization for non-acute SDH at a major Australian trauma centre.

Methods: A retrospective review was conducted of 16 patients who underwent MMA embolization for non-acute SDH between January 2024 and April 2025. Patients were selected following multidisciplinary team discussions involving neurosurgeons and interventional neuroradiologists. Embolization was performed using liquid and/or particle agents, as sole therapy or adjunct to surgical evacuation. Demographic data, anticoagulant/antiplatelet use, procedural details, adverse events, and recurrence rates were recorded. Clinical and radiological follow-up was undertaken in all patients.

Results: Of the 16 patients who underwent 26 hemispheric MMA embolization (bilateral or unilateral), 15 were aged 64–97, one aged 25 with a mechanical valve. Nine patients underwent surgical evacuation before embolization; one underwent preplanned surgery after embolization. Six patients were managed with MMA embolization alone. All patients underwent post-procedural imaging; 13 completed outpatient follow-ups. No radiological or symptomatic recurrences were noted. One patient experienced an MMA rupture interprocedurally, which was coiled without adverse outcome; no other adverse events were observed.

Conclusion: This preliminary cohort recorded no recurrence and minimal complications. The findings support the incorporation of MMA embolization into standard management algorithms as a primary modality or adjunct to surgery for selected patients with non-acute SDH. Larger prospective studies with longer follow-up are warranted.

Alfred Health Medical Staff Clinical Research – Junior Medical Researcher

How are doctors across medical specialties using commercial large language models? Insights from the Anthropic Economic Index

Mancewicz I, Xu Y, Ma J, Cao NC

Background: Commercial large language models (LLMs) have demonstrated potential across a range of medical applications, yet empirical data on their real-world clinical use remains limited. Understanding the extent and nature of LLM adoption by doctors across medical specialties could reveal practical insights into the implementation of AI in healthcare.

Methods: Using data from the Anthropic Economic Index (March 2025 release), we analyzed approximately one million anonymized conversations involving Claude 3.7, categorizing interactions by medical specialty, task intent, and type of AI interaction (augmentation vs. automation). Medical specialties and tasks were aligned with the Occupational Information Network (O*NET) database and adjusted for workforce size.

Results: Out of one million conversations, 5,998 (0.60%) were attributed to medical doctors, covering 17 specialties and 65 distinct clinical tasks. The majority of conversations involved diagnostics/interpretation (41.1%) and communication/consultation (27.6%), contrary to existing literature emphasizing administrative uses. Specialties such as radiology, allergology/immunology, and pathology showed the highest absolute LLM usage, while allergists/immunologists, pathologists and nuclear medicine physicians had the highest utilization when adjusted for workforce size. Physicians predominantly used AI to augment rather than automate tasks, with significant variation by specialty.

Conclusion: Our findings indicate a notable shift toward clinical rather than purely administrative use of commercial LLMs, particularly in diagnostics and patient communication. This study highlights differential adoption rates among specialties and underscores the ongoing transition from augmentation to automation, marking critical areas for future AI integration and development.

Alfred Health Medical Staff Clinical Research – Junior Medical Researcher

Point-of-Care Ultrasound in General Medicine: Establishing a New Service

Nicole Evans, Patrick Elliott, Harry Gibbs

Aims: Point-of-care ultrasound (POCUS) is established as a non-invasive complementary bedside tool in multiple specialties and is gaining popularity in General Medicine. This is a descriptive analysis of the implementation of a POCUS service in a busy General Medicine department at a quaternary teaching hospital in Melbourne.

Methods: We performed cardiopulmonary POCUS on General Medicine inpatients for relevant indications. We recorded the indication for scan, the findings, and whether the findings changed the diagnosis and/or management.

Results: We received 358 referrals for POCUS in 27 weeks. This included 101 cardiac scans, 64 pulmonary scans, and 189 combined cardiac and pulmonary scans. The commonest indications were dyspnoea (137 patients; 38%), assessment of left ventricular function (58 patients; 16%), fluid assessment (41 patients; 11%), cardiac murmur (31 patients; 9%) and syncope (21 patients; 6%). We found abnormalities in the great majority of patients, with no abnormality being found in only 57 cardiac scans and 37 pulmonary scans. In 38% of patients POCUS resulted in a change in diagnosis. In 47% of patients POCUS resulted in a change in management.

Conclusion: POCUS can be integrated into a hospital General Medicine service. Approximately 20% of new admissions are referred for POCUS. Abnormalities are often identified, and findings often change the provisional diagnosis and management plan.

Alfred Health Medical Staff Clinical Research – Junior Medical Researcher

A Retrospective Study of Tolvaptan Versus Urea for the Second Line Treatment of Hyponatremia due to Syndrome of Inappropriate Antidiuresis

Matthew B Morton, Vincent Ng, Anthony W Russell and Annabelle M Warren

Introduction: Hyponatraemia affects up to 30% of hospitalised patients. The Syndrome of Inappropriate Antidiuresis (SIAD, a.k.a. SIADH) is the most frequent cause. Initial treatment of hyponatraemia secondary to SIAD is with correction of underlying causes and fluid restriction, however refractory cases may require second-line urea or tolvaptan. The relative efficacy and safety of these treatments in raising plasma sodium (pNa) is unclear.

Methods: Retrospective single-centre cohort study in a tertiary hospital, Alfred Health, in Melbourne, Australia, of adult patients receiving tolvaptan or urea for the treatment of SIAD from November 2017 to October 2024 using dispensing data.

Results: We identified 141 eligible patients, 39 treated with tolvaptan and 102 treated with urea. Mean age was 69 years (tolvaptan) and 71 years (urea, p=0.466). Mean pNa on initiation of second-line therapy was 123mmol/L (tolvaptan) and 125mmol/L (urea, p=0.042).

The mean pNa rise after 24h was 5.9mmol/L (tolvaptan) and 2.2mmol/L (urea, p<0.001). After 72h, mean pNa was 6.0mmol/L (tolvaptan) and 5.9mmol/L (urea, p=0.866). A similar proportion achieved pNa above 130mmol/L at 72h (tolvaptan 49%, urea 58%, p=0.385). Overcorrection, defined as pNa rise >10mmol/L in 24h or >18mmol/L in 48h was more common after tolvaptan (13% v 2%, p=0.008). Interventions to slow the rate of correction occurred in 8% tolvaptan cases and 2% urea cases (p=0.100). There were no recognised complications of overcorrection including osmotic demyelination syndrome. Treatment-limiting side effects, distaste and nausea, occurred in 15% of the urea group.

Conclusion: Tolvaptan lead to a significantly higher sodium rise at 24h compared to urea. The efficacy was similar at 72h, both mean pNa rise and proportion with pNa >130mmol/L. Though in the urea group this was from a significantly higher baseline pNa. Tolvaptan was more commonly associated with sodium overcorrection, with no observed complications. Prospective randomised trials are required to accurately compare outcomes of these two therapies.

Alfred Health Medical Staff Clinical Research – Junior Medical Researcher

Understanding the biological pathways which underpin SKY92-defined high risk Multiple Myeloma

Hashini Thilakaratne, Nicholas Bingham, Jessie Zhao, Daniel Wong, Malar Ramachandran, Thalia Perez Suarez, Sueh Li Lim, Joanne Tan, Tiffany Khong, Durga Mithraprabhu and Andrew Spencer

Background: Despite globally improving survival rates, numerous Newly Diagnosed MM (NDMM) patients exhibit dismal prognosis. Conventional risk profiling often misidentifies these patients, particularly FHR patients who are defined as progressive disease within 18 months of diagnosis. Newer risk profiling techniques including the SKY92 gene signature may provide better risk prediction. Another cohort with unclear prognosis is those with SKY92 high-risk (SKY92 HR) who lack high risk cytogenetic abnormalities.

Aim: To explore clinical and gene expression patterns (GE) of two NDMM cohorts using SKY92 and other risk classifications.

Methods: SKY92 was performed on NDMM patients at Alfred. This gave GE of 92 genes and the whole transcriptome. Clinical outcomes were collected from medical records. GE patterns were assessed using dimension reduction techniques, differentially expressed genes (DEG) and pathway analysis.

Results: 59 patients were included.

The FHR subgroup included 48 patients with evaluable survival data. 13 patients met criteria for FHR. FHR patients exhibited poorer survival outcomes (p=0.018). Conventional (R-ISS, R2-ISS) and newer (SKY92) prognostic tools exhibited poor predictive utility for FHR.

FHR patients had seven DEG by SKY92 signature ($p<0.01$, LogFC>1) with enriched DNA replication, chromosome segregation and cell-cycle processes. On whole transcriptome pathway analysis, proliferative pathways were enriched. Therefore, we constructed a 6-gene signature (p = 1.44e-04, AUC = 0.912) to identify FHR.

48 patients had cytogenetics and SKY92 data. There were no differences in survival in patients with SKY92 HR without HRCA (n=17). By SKY92, they closely resembled patients with both, with 1 unique DEG ($p<0.01$, LogFC>1) between groups. These discordant patients showed unique whole transcriptome pathway patterns, enriched in MYC target and metabolic pathways.

Conclusion: This study provides insight into cohorts overlooked by conventional risk staging. FHR patient had a highly proliferative signature to be validated prospectively. Discordant patients exhibit unique gene expression patterns, related to MYC signalling.

Alfred Health Medical Staff Clinical Research – Junior Medical Researcher

Evaluating Quality Indicators in Gastric Intestinal Metaplasia Diagnosis and Management: A 13-Year Retrospective Study

J. Karp, D. Tjandra, A. Majeed, M. Morton, D. Liu, A. Pham, A. Boussioutas

Introduction: Gastric intestinal metaplasia (GIM) is a recognised precursor to gastric adenocarcinoma, with management dependent on accurate endoscopic recognition, histopathological characterisation, and appropriate follow-up. Although international guidelines such as MAPS II reinforce these quality indicators, their adoption in Australian practice is unclear.

Methods: We retrospectively reviewed patients undergoing index gastroscopy with biopsy at a tertiary centre between 1 January 2010 and 1 April 2023. Data collected included detection method, Helicobacter pylori (H. pylori) testing and eradication, and histological reporting of GIM extent and subtype. Outcomes were compared before and after 1 January 2020, corresponding with MAPS II publication.

Results: Among 13,987 patients, GIM was identified in 1,722 procedures involving 1,318 individuals. Of these, 1,149 procedures occurred pre-2020 and 573 post-2020 (mean age 66.4 ± 14.1 vs 66.2 ± 13.7 years; p=0.832). Endoscopic and histological recognition occurred in 15.9% of procedures, rising from 10.4% pre-2020 to 27.1% post-2020 (p<0.001), and from 6.5% to 15.6% when screening procedures were excluded (p<0.001). Histological extent was reported in 64.1% of cases, with no significant temporal difference (65.2% vs 62.0%; p=0.188). Reporting of subtype increased from 5.1% to 21.6% (p<0.001), though overall remained low (10.6%). Mean procedure duration was 11.2 ± 8.4 minutes, unchanged post-2020, while the number of images captured increased significantly from 4.9 ± 2.6 to 7.1 ± 3.4 (p<0.001). H. pylori testing beyond histology was performed in 27.0% of patients, increasing slightly post-2020 (27.0% to 29.5%; p<0.001). Eradication was confirmed in 54.2% of H. pylori-positive patients, improving from 48.9% to 61.7% (p=0.007). Follow-up within three years increased from 15.7% to 38.7% (p<0.001).

Conclusion: Post-2020, improvements were observed in GIM recognition, follow-up documentation, and H. pylori eradication confirmation, though adherence remained suboptimal. These findings reflect ongoing heterogeneity in clinical practice and highlight the need for further education efforts for endoscopists and pathologists alike.

Alfred Health Medical Staff Clinical Research – Senior Medical Researcher

Hyperbaric Oxygen Treatment for Idiopathic Sudden Sensorineural Hearing Loss – A Treatment Algorithm

Zhiliang Caleb Lin

Idiopathic sudden sensorineural hearing loss (ISSNHL) is a disabling condition where hyperbaric oxygen therapy (HBOT) is used to increase the chances of improvement. Despite its use for nearly two decades, there is still limited evidence to inform the best mode of delivery relating to consecutive treatments, treatment pressure, session numbers and interval outcome assessment. To streamline unit resourcing – an evidence review, survey of Australian unit practices and consultant survey was conducted to create a unit treatment algorithm.

As part of the evidence review, an update of the 2012 Cochrane systematic review and meta-analysis is being undertaken. The preliminary meta-analysis results suggest:

1. The addition of HBOT was associated with a higher rate of complete hearing recovery (RR 1.50 [1.17, 1.92]) – 857 participants; 10 studies, the number needed to treat for benefit (NNTB) was 4.7.
2. In participants with partial and complete recovery, HBOT was associated with a higher rate of overall recovery (RR 1.26 [1.13, 1.39]) – 1295 participants; 15 studies, NNTB = 5.5
3. The mean difference in hearing thresholds between HBOT and non-HBOT groups at the end of the variable follow up was -5.53 dB [-7.93, -3.13] in favour of HBOT – 406 participants: 5 studies.
4. Two RCTs compared daily to twice a day HBOT and found no difference in hearing outcomes.

A consultant survey was conducted in 2023, followed on with a survey of Australian units during the monthly fellows teaching in 2024. Through a consolidation of evidence, national benchmarking and consultant practice, a treatment algorithm was developed and implemented in 2025.

The HBOT treatment algorithm has resulted in less weekend recalls for the unit, providing cost savings. It has also created the opportunity for patients to make informed decisions about their care with regular weekly review points utilising current resources available at Alfred Health.

Alfred Health Medical Staff Clinical Research – Senior Medical Researcher

Personalised rehabilitation in ICU: Heterogeneity of treatment effect in the Trial of Early Active Mobilisation during Mechanical Ventilation in ICU

Prof Carol Hodgson

Purpose: Benefit or harm from early mobilisation (EM) in mechanically ventilated patients may vary by individual patient characteristics. We used machine learning to predict individualised treatment effects (ITEs) in the "Early Active Mobilization during Mechanical Ventilation in ICU" (TEAM) trial.

Methods: This was a secondary analysis of the TEAM trial using a causal inference approach to estimate individualised treatment effects (ITEs), which compared enhanced EM to usual care EM. Baseline variables in the original publication were used as predictor variables. The primary outcome was death by day 180. The dataset was randomly split into two halves (train and test) by site. In the training data, 5-fold cross-validation was used to compare six candidate machine learning algorithms. The best-performing model was evaluated in the test dataset. Patients were stratified into tertiles based on predicted ITEs, reflecting estimated benefit, no effect, or harm.

Results: We included 691 patients from 40 sites, and 143 (20.7%) patients died by day 180. Predicted individualised treatment effects (ITEs) in the test cohort ranged from an absolute 34.0% reduction to a 39.3% increase in mortality with enhanced EM. The interaction term between the model predictions and treatment assignment demonstrated significant heterogeneity of treatment effect (p=0.006). Patients predicted to have poor response to enhanced EM therapy were more likely to receive vasopressors, have diabetes and lower RASS scores at baseline, compared to patients predicted to have benefit.

Conclusion: Using baseline characteristics, a machine learning model identified patients with estimated benefit or harm with enhanced EM. Future testing of a personalised approach to mobilisation in the ICU is warranted.

Alfred Health Medical Staff Clinical Research – Senior Medical Researcher

A Prospective, Double-Blinded, Randomised Study Comparing the Quality of Samples and Safety of 16g Automated Full-Core and Side-Notch Biopsy Needles for Percutaneous Renal Biopsies in Renal

Bruno Di Muzio

Introduction: Renal Transplant Biopsies (RTBs) are critical for detecting early graft changes, rejection, chronic injury, and therapy-related complications, enabling timely interventions and better long-term outcomes. This study compares two 16-gauge biopsy needle designs, automated-full-core (FC) and automated-side-notch (SN), in terms of tissue adequacy, procedural efficiency, and user preference in ultrasound-guided RTBs.

Methodology: A prospective randomized trial evaluated ultrasound-guided RTB using FC and SN needles. Patients were randomly assigned to one of the two groups. Statistical analysis compared needle performance.

Results: The study included 58 procedures (24-FC, 34-SN), with 32 and 49 biopsy passes, respectively. SN-needles required slightly more passes (1.44 vs 1.33). SN-needles produced significantly longer samples (17.06mm vs 13.27mm, $p < 0.001$), but glomeruli per pass did not differ (14.5 vs 11.65, $p = 0.192$). FC-needles yielded significantly more glomeruli per millimetre (1.09 vs 0.68, $p < 0.001$), indicating better tissue quality. Procedure duration was shorter with FC-needles (28.6 vs 33.6 minutes, $p < 0.01$). Both needle types had excellent safety profiles with no complications. Proceduralists preferred SN-needles (15 vs 3), but FC-needles were rated as "very easy to use" more frequently (15 vs 6). There was no significant difference in additional passes required after on-site cytology assessment (25% vs 35%, $p = 0.417$).

Conclusion: Both needles have distinct advantages. FC needles demonstrated superior tissue quality efficiency, while SN needles produced longer cores and were preferred by proceduralists. The trial is on-going to include a larger sample size and further studies are warranted to validate these findings and assess long-term outcomes.

Alfred Health Medical Staff Clinical Research – Senior Medical Researcher

Vertebral fragility fractures: The 'low-hanging fruit' that deserves more attention. A retrospective audit at a quaternary Melbourne hospital

Albrahim Talat Wahbi Izzettin, James Fenn, Harry Gibbs, Ingrid Hopper

Background:

- Vertebral fragility fractures (VFFs) are the commonest fractures complicating osteoporosis (OP) in older Australians, are associated with significant morbidity, fracture recurrence, disability and premature mortality and are an indication for antiresorptive therapy.
- Identification of VFFs is important to optimise subsequent bone health therapy.
- The Alfred Hospital is a quaternary teaching hospital in Melbourne, and the General Medicine Unit provides care to a large proportion of hospitalized patients at risk of osteoporosis.
- Aims: We aimed to determine the rate of VFFs identified on imaging and the implementation of bone health interventions in patients with identified VFFs.

Methods:

- The Alfred Health radiology database was interrogated to identify
- patients admitted under General Medicine between 1 January and 31 March 2024 reported to have VFFs using CT or MRI.
- "Compression fractures", "height loss" and "wedge fractures" were used as
- search terms in the imaging reports.
- Traumatic, other types of pathological fractures and secondary OP were excluded.
- Electronic Medical Records (EMR) of identified patients were reviewed for progress notes, discharge summaries, investigations and treatment

Results:

- A total of 1008 imaging reports were audited.
- VFFs were identified in 42 patients with a mean age of 82 (SD=7.6).
- 22/42 (52%) patients with VFFs identified had no prior diagnosis of OP. None of the patients were prescribed anti-resorptive therapy and only 2 patients were referred for DEXA scanning.
- In patients with no prior history of OP, the reported VFFs were acknowledged by the medical team in the EMR for 13/22 patients (59%), and a follow-up management plan was made for 8/22 patients (36%).
- 7/20 (35%) patients with known OP on admission and VFFs identified were not receiving any anti-resorptive therapy.

Conclusions: In this audit, patients with VFFs identified on diagnostic imaging were not always acknowledged in the EMR, were infrequently referred for further testing or follow-up and the prescription of anti-resorptive treatment was low. Service improvement is required.

Alfred Health Medical Staff Clinical Research – Senior Medical Researcher

The Carbon Footprint of Different Medication Packaging Items at an Australian Tertiary Hospital

Loftus MJ, Forrester C, Shul L, Padgett C, Cruda MF, Macklin B, Vandenberg A, Leder K, Dooley M, McAlister S

Background: Medication packaging significantly contributes to the carbon footprint of pharmaceuticals. Since various materials and design choices can influence environmental impact, a greater understanding of the carbon footprint associated with commonly used types of medication packaging can guide efforts to reduce the environmental footprint of healthcare.

Aim: To assess the carbon footprint of packaging for a range of medications on an Australian tertiary hospital formulary and identify opportunities for reducing environmental impact.

Methods: A life cycle assessment was conducted to determine the carbon footprint (carbon dioxide equivalent, 'CO2e') of packaging across six common product categories: blisters, tablets in bottles, oral liquids in bottles, vials, glass ampoules, and plastic ampoules. Ethics approval was obtained from the Alfred Health Ethics Committee (Project 465/23).

Results: Twenty-six products were assessed across the six categories. Within each category, the lowest CO2e values for packaging were between 19% (glass ampoules) and 76% (blisters) lower than the highest CO2e values. These CO2e differences were driven by the different materials used or from smaller packaging size (less empty space). Recycling materials like aluminium further reduced the environmental impact, with CO2e reductions of up to 81% for blister packs and 56% for tablet bottles. Some safety features, such as printed information over every blister-packed tablet may potentially conflict with sustainability principles (avoiding empty spaces).

Discussion: Reducing environmental impact of medication packaging can be achieved through the selection of lower-footprint materials, optimised packaging sizes, and increased recycling of waste material. While some safety features require larger packaging and greater use of raw material, this is not always the case. These findings highlight features that can reduce the carbon footprint of medication packaging.

Alfred Health Medical Staff Clinical Research – Senior Medical Researcher

General Medicine Acute Streaming Team; 'Right Care at the Right Place at the Right Time'

Ibrahim Talat Wahbi Izzettin, Archana Thayaparan, Harry Gibbs

Background:

- The Alfred Hospital (TAH) is a quaternary hospital in Melbourne that is part of Alfred Health (AH).
- Previously, patients referred to General Medicine (GM) from The Alfred Hospital Emergency and Trauma Centre (ETC) were admitted to TAH even if their care needs could be better met in the community or at an alternative AH site.
- Delayed transfer from TAH to these sites can lead to poor patient experience, inefficient resource utilisation, delay in progression of care and increased risk of adverse events due to unnecessary transitions of care.
- The General Medicine Acute Streaming Team (GMAST) was introduced in March 2023 to streamline the referral process to GM, optimise patient care and improve the efficiency of bed flow and access.
- GMAST is a consultant-led team, facilitating discharge of patients from the ETC to their usual residence with community support. Patients requiring hospital-level

Aims: To setup a general medicine acute streaming service (GMAST) and assess the effectiveness of this new model of care in streaming patients to the most appropriate AH care site.

Methods: We conducted an audit of the GMAST model of care through interrogation of daily general medicine referrals, admissions and transfers using the Electronic Medical Records (EMR) over a period of 18 months.

Results:

- 7368 patients were reviewed by GMAST from June 2023 to January 2025.
- 4421 patients (60%) required an admission to TAH. Reasons included high acuity care needs, COVID isolation, specialty input, cardiac monitoring and further investigations or procedures.
- From a total of 2726 patients (37%) who were not admitted to TAH, 1474 (54%) of patients were discharged to their usual residence with community support, and 1253 patients (46%) were transferred to an alternative AH site.
- Of the initial GMAST referrals, 3% had their care transferred to an alternative speciality unit.

Conclusions: GMAST has facilitated senior decision-making and effective transfer of patients with acute medical needs to the most appropriate care setting.

Alfred Health Medical Staff Clinical Research – Senior Medical Researcher

Epidemiology and Management of Invasive Infections in People Who Inject Drugs: Results from a Prospective Multicentre Cohort Study

Attwood LO, Lee SJ, Bryant M, Coldham A, Tang M, Velasquez Reyes D, Tong SY, Owen M, Davis J, Athan E, Botheras C, McCarthy K, Runnegar N, O'Callaghan K, Holmes NE, Gador-Whyte AP, Miyakis S, Jerzyna L, Vujovic O, Higgs P, Doyle JS, Stewardson AJ

Background: Invasive infections in people who inject drugs have increased globally.

Aims: To describe the burden, spectrum, management, and outcomes of injecting-related invasive infections in Australia. To determine the impact of models of care on completion of planned antimicrobials.

Methods: We performed a multicentre, prospective cohort study at ten hospitals across Victoria, New South Wales and Queensland. Adults admitted with an invasive infection and injecting drug use within the previous six months were eligible. Data was collected on study entry and discharge. The primary exposure of interest was the modality used to administer antimicrobial therapy.

Results: Between February 2022 - September 2024, we recorded 305 admissions involving 271 patients. The cohort was predominantly male (184/271, 67.9%) with a median age of 46 years (IQR 39–52). Unstable housing was common (73/305, 24.7%) and most participants reported injecting drug use within the week prior to admission (210/305, 68.9%). The most common diagnosis was infective endocarditis (86/305, 28.2%). Surgery occurred in 142 admissions (46.6%) and intensive care unit admission in 93 (30.5%). More than 1 in 5 admissions (68/305, 22.3%) did not receive an addiction medicine review. Unplanned discharges occurred due to patient directed discharge (76/305, 24.9%), eviction (9/305, 3.0%) and death (21/305, 6.9%). Most admissions were managed with inpatient intravenous antimicrobials (158/305, 51.8%), while 14.4% received outpatient parenteral antimicrobial therapy (OPAT) (44/305). Management with OPAT was associated with a sevenfold increase in odds of completing planned intravenous antimicrobials compared to management with inpatient antimicrobials after adjusting for confounders (CI 1.4 – 29.3, p=0.015).

Conclusions: Invasive infections in people who inject drugs result in significant morbidity yet there is a high proportion of patients who disengage from care. Admissions on OPAT had a significantly greater odds of completing intravenous antimicrobials compared to remaining an inpatient for management.

Alfred Health Medical Staff Clinical Research – Senior Medical Researcher

Impact Of Mild Hypercapnia on Left Ventricular Global Longitudinal Strain in Comatose Adults Resuscitated After Out-Of-Hospital Cardiac Arrest: A Single-Centre, Pre-Planned Exploratory, Cohort Sub-Study of the Mild Hypercapnia Vs Normocapnia After Out-Of-Hospital Cardiac Arrest (Tame) Randomised Trial

Nanjayya VB, Nichol A, Roberts L, Hartshorne T, Hung M, Orosz J, Tan LH, Burrell A, Ihle J, Kaye D, Higgins AM, Eastwood G, Cooper DJ

The effect of hypercapnia on cardiac function in adults resuscitated after cardiac arrest is not well understood.

Aim: To identify the effects of mild hypercapnia ($PaCO_2$ 50-55 mmHg) compared to normocapnia ($PaCO_2$ 35-45 mmHg) on left ventricular (LV) systolic function using global longitudinal strain (GLS) in resuscitated out-of-hospital cardiac arrest (OHCA) patients.

Methods: We performed a pre-planned single-centre, prospective, exploratory sub-study of the Targeted Therapeutic Mild Hypercapnia After Resuscitated Cardiac Arrest (TAME) trial. Two transthoracic echocardiograms were performed in both mild hypercapnia and normocapnia groups - first, within 24 hours during intervention and second, 24-72 hours after return of spontaneous circulation. The GLS was compared between the two groups and within each group.

Results: We studied 13 TAME trial patients- six in the mild hypercapnia group and seven in the normocapnia group. The GLS was low in both groups during and after the intervention period. During hypercapnia, the mild hypercapnia group had worse median GLS compared to the normocapnia group [-10.2% (Q1-Q3: -11.5 - -8) vs -14.2% (Q1-Q3: -15.2- -11.2), p=0.046]. The median GLS did not improve significantly after restoring normocapnia in the hypercapnia group [-10.2% (Q1-Q3: -11.5- -8) to -11.6% (Q1-Q3: -11.6 (-12.1- -7,8); p=0.63]. Repeated measures mixed-effects regression showed no significant worsening of GLS due to hypercapnia [-2.7% (95% CI: -0.7 to 6.03); p=0.12].

Conclusion: In this exploratory sub-study, comatose adults resuscitated after OHCA had persistent LV dysfunction as demonstrated on echocardiography using GLS even after the cessation of mild hypercapnia. Compared to normocapnia, mild hypercapnia did not appear to impair systolic LV function.

Burnet Institute Prize for Infectious Diseases Research

Mechanistic Insights into Phage Therapy Failure: Anti-Phage Immunity and Bacterial Heteroresistance

Gordillo Altamirano F, Subedi D, Beiers M, Bucher M, Dahlman S, Patel DM, Parker M, Korneev D, Robinson MJ, Pragastis K, Wisniewski J, Rees C, Ramshaw H, Khan SF, Gardiner BJ, Hammerschlag Y, Keating D, Kotsimbos T, Hawkey J, Barr JJ, Peleg AY

Phage therapy, the clinical use of viruses that kill bacteria, is an emerging treatment against multidrug-resistant infections. Unfortunately, treatment failures occur and remain poorly understood. Mechanistic, hypothesis-driven studies in real patients are rare.

Aim: To determine why phage therapy failed in a patient with cystic fibrosis and chronic extensively drug-resistant Bordetella bronchialis infection by exploring host immunity, bacterial genomics and phage biology.

Methods: Bacteriophage øSimón, isolated from local wastewater, displayed potent in vitro activity against several strains from the patient and was manufactured to clinical grade. The patient received a one-month course of intravenous øSimón. Longitudinal samples were analysed for bacterial load and phage levels. Anti-phage immunity was probed using neutralisation assays, ELISA, cross-reactivity studies and immune-TEM (transmission electron microscopy). Microbial populations were sequenced to detect phage-resistance mechanisms.

Results: Treatment was safe, with early signs of efficacy: blood cultures cleared, and sputum bacterial load fell by ~1 log on day 8 with active phage replication. By day 17, the bacterial burden rebounded as øSimón disappeared. Pre-treatment serum neutralised ~25% of phage in 30 min, rising to ~75% by day 21. ELISA confirmed anti-øSimón antibodies in serum and sputum, with TEM showing antibodies binding to multiple phage structures. Surprisingly, these antibodies cross-reacted with inducible prophages from the bacterial pathogen's genome, implicating chronic exposure as the source of pre-existing immunity. Additionally, population genomics analysis revealed that up to 5% of the patient's B. bronchialis had multifactorial reduced susceptibility to øSimón.

Conclusion: This clinical study links pre-existing anti-phage immunity and bacterial heteroresistance to therapeutic failure. By integrating immunology, microbiology, and genomics, it provides a blueprint for more effective personalised phage therapy. At our institution, we now screen prospective phage therapy patients for neutralising antibodies and population-level bacterial sensitivity. Our findings move phage therapy beyond anecdote, offering actionable principles to guide future trial design.

Burnet Institute Prize for Infectious Diseases Research

Awareness, usage, and perceptions of doxycycline prophylaxis for STI prevention among gay and bisexual men and trans and gender diverse people in Australia

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The Australian Consensus Statement on doxycycline prophylaxis (doxyPEP) for STI prevention was published in September 2023.

Aim: This study aimed to examine the awareness, usage, and perceptions of doxyPEP in Australia.

Methods: An online cross-sectional national survey was conducted between July and November 2024. Participants were recruited from sexual health clinics, general practice, social media and dating apps. Eligible participants were ≥18 years, living in Australia and self-identified as gay and bisexual men and trans and gender diverse people.

Findings: Among 2095 participants, half (51.6%, 1080/2095) had heard of doxyPEP. Of those, 29.9% (323/1080) had ever used doxyPEP, and 28.35% (306/1080) were recent users. DoxyPEP awareness and usage varied by HIV status and PrEP use ($p<0.0001$). Most users had taken the recommended 200mg within 72 hours after sex (63.5%, 205/323); however, 14.2% (46/323) had taken 100mg daily, and 21.7% (70/323) had used other regimens. Among recent users, 9.5% (29/306) reported recent syphilis diagnoses in the past 12 months, and 27.8% (85/306) had ≥2 STI diagnoses in the past 12 months. Of those who had ever used doxyPEP, (41.8%, 135/323) obtained prescriptions from Australian clinicians, 5.3% (17/323) obtained it online without a prescription, and 8.7% (28/323) purchased it overseas in-person without a prescription. Of those aware of doxyPEP, 45.6% (490/1080) planned to use doxyPEP in the next 12 months, primarily to prevent chlamydia (93.9%, 460/490), gonorrhoea (86.1%, 422/490) or syphilis (78.8%, 386/490). Some intended to prevent Mycoplasma genitalium (18.8%, 92/490) or mpox (7.4%, 36/490). Among non-users, 40.5% (306/756) worried about antibiotic resistance.

Conclusion: DoxyPEP uptake was happening quickly in the community, but with a complex implementation landscape. Community practice involved non-recommended regimens and unsupervised sourcing, driven by situational risk assessments rather than clinical criteria recommended by the statement. Persistent barriers necessitate urgent educational interventions and improved access for safe, effective implementation.

Burnet Institute Prize for Infectious Diseases Research

A One-Stop-Shop for Hepatitis-C Care in the Community Corrections Setting: The Nurse and Peer-Led C No More Study

Samara Griffin, Rebecca J Winter, Jacinta Holmes, Bridget Reid, Jane Dicka, Anne Craigie, Timothy Papaluca, Bradley Whitton, Amanda Callus, Mark Belzer, Margaret Hellard, Alexander Thompson, Mark Stoové

Hepatitis C virus (HCV) treatment initiations have declined, and adaptable models of care are required to reach people yet to be treated and achieve elimination goals. Community corrections offices provide a potential touchpoint for justice-involved populations at risk for hepatitis C. A low-threshold, flexible model of care that maximises accessibility could provide care to this high-risk group.

Aim: To evaluate the clinical effectiveness of a nurse and peer-led mobile model of hepatitis C care in community corrections-adjacent locations in Melbourne, Australia.

Methods: We implemented a nurse and peer-led outreach service from a clinically equipped mobile van from August-2023 to August-2025. Peer workers opportunistically recruited participants within the vicinity of five community corrections offices. Participants were tested with point-of-care HCV antibody tests and, if testing or self-reported antibody positive, point-of-care HCV RNA tests. RNA positive participants were provided individualised support throughout rapid treatment initiation.

Results: Among 1,013 participants who were tested for HCV, 322 (32%) were on community corrections orders, 758 (75%) had a criminal justice history (previous prison/corrections order), 559 (55%) reported current/previous injecting drug use and 205 (20%) self-reported previous HCV treatment. Of 74 (7%) of participants who were positive for HCV RNA; 55 had liver function testing; 23 had an APRI >1, 12 had a Fibroscan, seven were diagnosed with cirrhosis, and one individual was diagnosed with hepatocellular carcinoma. Of 74 RNA positives, 68 (92%) commenced treatment (including five treated elsewhere), 39 (62%) achieved sustained virological response (SVR), two (3%) did not achieve SVR due to nonadherence, one passed away, and 21/63 (33%) remain to be tested for SVR.

Conclusion: A mobile, nurse and peer-led model was effective at screening high numbers of people with risk factors for hepatitis C and treating a high proportion of people with justice involvement who were RNA positive and disengaged from care.

Burnet Institute Prize for Infectious Diseases Research

Predicting the Impact of Antimalarial Resistance in West African Parasites

Rachael Yong, Claudia B. G. Barnes, Ruben V. Heuvel, Zahra Razook, Michael F. Ofori, Eniyou C. Oriero, Alyssa E. Barry, Paul R. Gilson, Carlo Giannangelo, Charles A. Narh, Hayley E. Bullen

Background: Africa bares the highest malaria burden, with 569,000 deaths in 2023. Artemisinin combination therapies (ACT) remain the frontline treatment but are becoming less efficacious due to delayed parasite clearance linked to mutations in the Plasmodium falciparum Kelch 13 (K13) gene. While well documented in East Africa, similar resistance is predicted to emerge in West Africa.

Aims and Methods: This study investigates artemisinin phenotypes in contemporary West African parasites. A total of 380 isolates from Ghana and The Gambia will be genotyped, with 15 multi-drug-resistant isolates selected for whole-genome sequencing. Known resistance markers, including pfcrt, pfmdr1, and plasmepsin 2/3, will be assessed and correlated with phenotype across adapted parasite lines. Three genetically diverse culture-adapted Ghanian strains will be transfected with key K13 mutations (R561H, 622I, A675V, C469Y) to analyse their resistance phenotypes. Multi-omics approaches will identify biochemical hallmarks linked to artemisinin resistance.

Results: Preliminary genotyping has revealed pyrimethamine resistance markers typically associated with mild resistance. However, phenotypic assays suggest strong resistance, indicating additional mechanisms may be involved. Initial work will correlate genotypic markers with phenotypic profiles across the same parasite populations.

Conclusion: These findings will inform ACT resistance surveillance and treatment strategies in West Africa.

Burnet Institute Prize for Infectious Diseases Research

Nitrofurantoin Efficacy and the Influence of Urodynamics Among Multidrug-Resistant Escherichia Coli in an In Vitro Bladder Infection Mode

Anderson CRB, van Gorp E, Landersdorfer CB, Meletiadis J, Peleg AY, Abbott IJ

Nitrofurantoin can be utilised to treat multidrug-resistant (MDR) urinary tract infections; however few studies have investigated nitrofurantoin's urine-specific PK/PD relationships.

Aim: To define urine-specific nitrofurantoin exposure-response relationships that provide optimal killing and suppress emergence of resistance in MDR E. coli

Methods: 130 MDR E. coli uropathogens underwent testing to ascertain susceptibility. 15 clinical uropathogens and one ATCC isolate were selected for further susceptibility testing and in-vitro modelling. Susceptibility testing in nonstandard media (modified synthetic human urine; mSHU) was performed. Isolates underwent 24-hour growth assessments in static, and dynamic conditions. Isolates additionally underwent simulated dynamic nitrofurantoin therapy within an in vitro bladder infection model. Average nitrofurantoin exposure (50mg q6h) was simulated for 5 days (C_{max}=84mg/L, AUC_{0-24}=982.5 mg.h/L) as well as a low-exposure simulation (C_{max}=42mg/L, AUC_{0-24}=483.0 mg.h/L).

Results: MDR isolates displayed a range of nitrofurantoin MICs from 1-256mg/L (susceptible 96.9%, n=126; resistant 3.1%, n=4). MICs were lower in mSHU than standard media (bias -1.5±0.7303 $\log_2$ 2-fold dilutions). Whilst all isolates grew well in static conditions after 24 hours (8.2±0.61 $\log_{10}$ cfu/ml), under dynamic conditions growth rates declined, with two isolates failing to reach maximal growth. At end-of-treatment during the average-exposure experiments, 3/16 isolates were below the limit of detection, 10 isolates maintained low-density populations (3.2±0.5 log10 cfu/ml) with the remaining isolates reaching maximal growth (7.0±0.2 log10 cfu/ml). At end-of-treatment during the low-exposure nitrofurantoin dosing experiments, one isolate was below the limit of detection, 9 isolates maintained low-density populations (3.8±0.6 log10 cfu/ml) with the remaining isolates reaching maximal growth (7.1±0.6 log10 cfu/ml). No isolate was completely sterilised across all experiments.

Conclusion: Nitrofurantoin therapy was successfully simulated. The strain the urodynamics imposed on some isolates highlights the importance of performing PK/PD testing in dynamic and physiological conditions. Nitrofurantoin's bacteriostatic/bactericidal effects warrant further study and its PK/PD metrics in urine further examined.

Burnet Institute Prize for Infectious Diseases Research

Age is an intrinsic driver of inflammatory responses to Malaria

Nicholas L. Dooley, Jessica R. Loughland, Zuleima Pava, Arya SheelaNair, Dean Andrew, Peta Tipping, Peter Bourke, Christian Engwerda, J. Alejandro Lopez, Kim Piera, Timothy William, Bridget E Barber, Matthew Grigg, Nicholas M Anstey, Gabriela Minigo and Michelle J. Boyle

Age is a critical factor influencing the host immune response to infection and disease pathogenesis. In malaria, the risk of severe disease increases with age in non-immune individuals. Systemic inflammation contributes to severe malaria, but the specific cells and mechanisms contributing to age-dependent disease risk are incompletely understood. Here, we assessed inflammatory cytokines in non-immune children and adults with clinical malaria, and the phenotypic, functional and transcriptional differences of in vitro innate cell responders to malaria parasites in naive children and adults. During naturally acquired malaria, age was associated with increased plasma levels of inflammatory chemokines CCL2, CCL3, CXCL8, CXCL9, along with CRP, and IDO, which were associated with clinical symptoms. In malaria naive individuals, classical monocyte and $V\delta2^{+}$ δ T cell responses from adults were characterized by higher inflammatory cytokine production, and transcriptional activation following stimulation with malaria parasites. Classical monocyte responses in adults were dominated by CCL2 production, while in children the response had increased IL10 production and enrichment in IL10 signaling pathways upon parasite stimulation. This heightened inflammatory response in adults was not mitigated by parasite induced Tregs. Taken together, these findings identify cellular mechanisms of age-intrinsic host responses that play crucial roles in driving inflammatory responses in malaria.

Burnet Institute Prize for Infectious Diseases Research

Impact Of Microbiology Reporting in ICU Patients Investigated For Hospital Acquired or Ventilator Associated Pneumonia

Isabel Jones, Kelly Cairns, Rachael Leng, Andrew Udy, Iain Abbott

Background: Intensive Care Units (ICU) use large quantities of antibiotics, with hospital-acquired pneumonia (HAP) and ventilator-associated pneumonia (VAP) one of the most common indications.

Aim/Objective: To determine how the reporting of respiratory culture results influences antibiotic prescribing for suspected HAP and VAP in ICU patients.

Methods: A single-centre retrospective cohort review of ICU patients with suspected or confirmed HAP/VAP over 12-months of 2023 was undertaken. Clinical characteristics and respiratory culture results were collected. Antibiotic therapy was collected for patients who remained in ICU for ≥7 days after culture collection. Final respiratory culture results were assessed for concordance with American Society for Microbiology (ASM) guidelines.

Results: 242 patients investigated for HAP/VAP were included. Two-thirds were male (68.6%), median age 59-years (IQR: 48-70). Three-quarters (n=182, 75.2%) were intubated at time of collection. Median ICU length of stay was 10.0 days (IQR: 5.0–16.8). All-cause in-hospital mortality was 13.2%. Antibiotic data was evaluated in 128 (52.9%) patients. Most were receiving antibiotics at respiratory sample collection (n=93, 72.7%). Almost half (n=63/128, 49.2%) had therapy changed following final culture reports, namely antibiotic switch (n=42/63, 66.7%) or cessation (n=21/63, 33.3%). The difference in antibiotic cessation rates between patients with and without reported pathogens was not statistically significant, although there is a clinically meaningful trend (41.9% v 15.0%, p=0.07). Of all initial specimens collected, 208 (86.0%) were concordant with ASM guidelines. A pathogen was reported in 66 (27.3%) patients, of which 29 (44.0%) were 'over-reported. Mortality was highest in patients with a pathogen concordant with ASM guidelines (n=8/32, 25%).

Discussion: We highlight the importance of microbiology reporting for antimicrobial stewardship in the ICU. Clinicians appeared more likely to cease antibiotics when no pathogen was reported compared to when a pathogen was identified. Further work will assess how aligning local microbiology reporting with ASM guidelines impacts antibiotic prescribing.

Burnet Institute Prize for Infectious Diseases Research

Optimising PJP Prophylaxis in Immunocompromised Patients: Understanding the Role of Atovaquone

To N. Pham, Kelly A. Cairns, Carmela E. Corallo, Bradley J. Gardiner

Background: Pneumocystis jirovecii pneumonia (PJP) is an opportunistic infection associated with poor outcomes in immunosuppressed patients. Trimethoprim-sulfamethoxazole (TMP-SMX) is the agent of choice for PJP prophylaxis due to its efficacy, low cost and spectrum of activity. Atovaquone is an alternative to TMP-SMX, but its use is limited by high cost and lack of accessibility. At our centre, there has been a considerable increase in the use of atovaquone since 2020.

Aim: To understand the use of atovaquone for PJP prophylaxis, including prescribing patterns, indications, duration, preceding and subsequent agents.

Methods: A retrospective cohort study including all patients who received atovaquone for PJP prophylaxis at Alfred Health from January 2015 to December 2022 was performed. Participants were identified from the hospital pharmacy dispensing software. Clinical data were collected from medical records, including baseline demographics, indications and duration of atovaquone, the pre-atovaquone agent and reason for its cessation, and TMP-SMX contraindication.

Results: Of the 150 participants, 124 (83%) initiated atovaquone after 2020. Indications for PJP prophylaxis were solid organ transplant (74, 49%), haematology conditions including bone marrow transplant (53, 35%), HIV (8, 5%), and other (11, 7%). 67 patients (45%) were switched to atovaquone from TMP-SMX. The most common TMP-SMX contraindications were cytopenia (55, 37%), renal impairment (22, 15%), drug interactions (18, 12%), and rash (17, 11%). 32 patients (21%) were on dapsone before atovaquone, 27 (18%) were on pentamidine and 20 patients (13%) started on atovaquone as the first agent for PJP prophylaxis. The median duration of atovaquone was 137 days (IQR 46-440). After the atovaquone course, 57 patients (38%) were able to recommence TMP-SMX.

Conclusion: Atovaquone indications were predominantly related to TMP-SMX related adverse events including cytopenia and renal impairment. Establishing well-defined criteria for the initiation and cessation of atovaquone and rechallenging of TMP-SMX can help optimise PJP prophylaxis prescribing.

Burnet Institute Prize for Infectious Diseases Research

Impact Of Targeted Interventions on Atovaquone Prescribing for Pneumocystis Jirovecii Pneumonia Prophylaxis

Corallo C, Ly J, Dimopoulos E, Ivulich S, Snell G, Gardiner B, Coutsouvelis J, Kwok R, Warner V

Background: Trimethoprim and sulfamethoxazole (TMP-SMX), the established first-line agent for Pneumocystis jirovecii pneumonia (PJP) prophylaxis, is associated with adverse effects including cytopenias and acute kidney injury (AKI). Atovaquone is an alternative agent, however it is expensive and lacks activity against other opportunistic infections, including Nocardia. At Alfred Health there was a ten-fold increase in expenditure on atovaquone from 2020-2023, reaching $500,000 annually. Objective: To implement and evaluate the impact of unit-based protocols for prescribing PJP prophylaxis in transplant recipients.

Method: In May-2024 protocols were developed and implemented in the heart, kidney, lung and bone marrow transplant units. These guide criteria for TMP-SMX cessation, using unit-defined neutropenia and AKI criteria, indications for alternative agents including atovaquone, and criteria for re-introduction of TMP-SMX. Pharmacists in each unit provided a range of interventions including patient review and physician education. The impact of these interventions on atovaquone prescribing was assessed.

Results: Following protocol implementation atovaquone prophylaxis was reviewed for 64 patients and ceased in 37 (58%). TMP-SMX was re-trialled in 30 cases, including at a reduced dose for 17. PJP prophylaxis was ceased in seven patients no longer at risk. Atovaquone indications were reassessed for 27 continuing patients; 19 were in accordance with the protocols. The number of new patients prescribed atovaquone decreased by 17% to 43, compared to 52 one year earlier. There was a $388,000 decrease in expenditure 12 months following protocol implementation, a reduction of 64% from the prior year.

Discussion: The use of atovaquone or other alternatives to TMP-SMX for PJP prophylaxis requires careful consideration to avoid opportunistic infections and minimize costs. At Alfred Health, the implementation of unit-specific protocols, that include thresholds for TMP-SMX cessation and criteria for rechallenge, resulted in the majority of patients being switched back to TMP-SMX and a substantial reduction in atovaquone-associated expenditure.

Burnet Institute Prize for Infectious Diseases Research

Latent cytomegalovirus infection is associated with an impaired adaptive immune response after vaccination for SARS-CoV-2 (COVID-19)

Patrick Maclean, C. O'Neill, V. Naranbhai, J. Knight, A. Mentzer

Immune responses to vaccination are highly heterogeneous, including for SARS-CoV-2. The impact of latent herpesvirus infections on this variability is unclear. Cytomegalovirus (CMV) is a near-ubiquitous infection linked to adverse immune and health outcomes in later life. Using a large cohort of older adults with baseline CMV testing, we examined whether latent CMV infection was associated with the magnitude of antibody responses to SARS-CoV-2 vaccination.

Methods: 200,000 UK Biobank (UKBB) participants completed an anti-Spike IgG lateral flow assay after receiving two doses of a SARS-CoV-2 vaccine during the initial vaccine rollout in 2020-21. In 10,000 randomly selected members of the cohort, baseline serostatus for a range of latent infections including CMV was available. We used logistic regression to test for associations between SARS-CoV-2 seroconversion after vaccination and baseline CMV serostatus, adjusting for known confounders including age, sex, body mass index, vaccine type, smoking and a composite index of socioeconomic status. Data was accessed under project ID 43920.

Results: 871 individuals had SARS-CoV-2 antibody and CMV serostatus data available. In an adjusted model, participants with latent CMV were less likely to mount a detectable immune response after two doses of SARS-CoV-2 vaccine (OR 0.69, 95% CI 0.48 - 0.97, p = 0.03). Other significant predictors in the combined model included male sex (OR 0.63, 95% CI = 0.45 - 0.88, p = .01), older age (OR 0.95 per year, 95% CI 0.92-0.98, p = 0.04) and higher BMI (OR 0.95 per unit, 95% CI 0.92 - 0.99, p = 0.04).

Discussion: Our results suggest that latent CMV is associated with adverse responses to SARS-CoV-2 vaccination, with a similar effect size to male sex. Individuals' serostatus could be incorporated into risk prediction models designed to target booster vaccinations to at-risk cohorts.

Burnet Institute Prize for Infectious Diseases Research

Expanding Access to Hepatitis C Testing and Treatment Through Community Pharmacies (Expand-C): The First 100 Participants

Mackie KF, Allardice K, Guzman R, Teasdale A, Anderson J, Wang D, Bryant, M, Elsum I[1], Richmond J, Wade AJ, Doyle J

Background: To meet the World Health Organisation Hepatitis C virus (HCV) elimination targets, Australia must increase testing and treatment for people at risk of hepatitis C infection. Community pharmacies dispensing Opioid Agonist Therapies are well-positioned to "meet consumers where they're at". The EXPAND-C project aims to engage 100 pharmacies over two years to offer point-of-care testing (POCT) and linkage to care; here we present results from the first 100 participants.

Aims:

- Measure the care cascade (number diagnosed, proportion treated) for people tested for HCV at community pharmacies.
- Build a network of community pharmacies engaged in HCV care.
- Evaluate consumer acceptance and feasibility of pharmacy-based HCV care

Methods: Pharmacists provided HCV education and referred consumers to an on-site study-nurse. Eligible participants received a fingerpick POCT using the INSTI HCV Antibody Test (result in 1 minute) and a $20 voucher. Exclusions: age <18, pregnancy/breastfeeding or tested in the past 12 months. Positive HCV-Ab participants (from POCT result or previously known) were offered on-the-spot venipuncture (including HCV RNA, plus panel for safe HCV treatment). Participants with HCV RNA detected were linked to treatment.

Results: Of 100 participants across nine pharmacies, 98 met inclusion criteria (62% male, 8% Aboriginal and/or Torres Strait Islander). Recent injecting (<6 months) was reported by 59%; 40% had injected >6 months ago. Whilst 79% reported past HCV testing, 12% had never been tested and 8% were unsure. Of 45 POCTs, 20 (44%) were HCV-Ab positive. Combined with 53/98 reported known HCV-Ab positivity, 73/98 (74.5%) were offered venipuncture on-the-spot (15 unsuccessful: difficult access or declined). Venipuncture was successful on 58/73 (79.5%) participants with 5/58 (8.6%) HCV RNA positive referred on for treatment.

Conclusion: Offering consumers POCT in community pharmacies is showing promising signs as an accessible healthcare opportunity. This project will continue to recruit more pharmacies, including regional and interstate.

Burnet Institute Prize for Infectious Diseases Research

Tackling Irreproducible Single-Cell Omics Enrichment Analysis in High and Low Impact Journal Articles

Bora A, McKenzie M, Telonis-Scott M, Ziemann M

Functional/gene set enrichment analysis identifies differentially regulated gene pathways from high-throughput profiling data. According to PubMed, it is one of the most used techniques in computational biology with ~ 60,000 articles with related keywords in 2025. The results of enrichment analysis provide information on underlying biological processes and signaling pathways in a disease state. Despite its popularity, there are concerns around the reliability of these results. Some critical issues related to lower reproducibility of enrichment studies include the lack of background correction in gene list analysis, lack of p-value correction when carrying out parallel tests, and a general lack of methodological details. These issues lead to statistically flawed results and studies that cannot be reproduced due to missing information.

Aim: To highlight reproducibility problems in the scientific community and work on rectifying problematic studies.

Methods And Results: In a survey done by our team, 151 enrichment articles published from 2020 till 2023 were checked from various high impact journals. From this, 70% of articles did not mention statistical tests used in their analysis, 83% articles did not specify background gene-list, and ~40% articles did not use False Discovery Rate (FDR) values. Articles from respected journals like Nature Communications, and Nucleic Acid Research had high error rates for critical parameters. We have revived the commonly used DAVID Bioinformatics tool (version 6.8), which is no longer available, to perform enrichment analysis and enhance our reproducibility checks. We will reveal reproducibility results of 30 high and low impact journal articles and highlight major issues observed in reproducing the results of these published analyses.

Conclusions: With our work, we aim to understand root causes of these problems in detail, devise solutions, develop tools and provide recommendations for performing rigorous enrichment analysis, with intentions to improve the quality of published bioinformatics research.

Burnet Institute Prize for Infectious Diseases Research

Sex differences in Hepatitis C elimination outcomes: A multinational study

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Background: Highly effective direct-acting antiviral (DAA) therapies for hepatitis C virus (HCV) have led to reductions in HCV incidence in people with HIV through a treatment-as-prevention effect. However, it is unknown whether the treatment-as-prevention effect differs by patient sex. We aim to estimate sex differences in HCV primary incidence among people with HIV associated with different periods of DAA access.

Methods: The International Collaboration on Hepatitis C Elimination in HIV Cohorts (InCHEHC) pooled data from Australia, France, Italy, Netherlands, Spain, and Switzerland. Those with an HCV antibody (HCVab) negative result followed by ≥1 subsequent HCV test were included. Men who have sex with men were excluded. Incidence rates (IR) were estimated by DAA availability period (pre-access and broad access), stratified by sex and cohort country. Poisson regression estimated IR ratios (IRR) per 100 person years (PY), with patient sex included as an interaction term to assess effect modification.

Results: Of 19,953 eligible participants with a HCVab negative result, 8,659 (43%) were female at birth. We observed 209 incident HCV infections over 74,981PY in males and 97 incident infections over 59,012PY in females. Primary incidence per 100PY was lower among females (0.24, 95%CI=0.16–0.36) than males (0.35, 95%CI=0.25–0.49) prior to broad access (IRR: 0.68, 95%CI=0.48–0.97). Compared to the pre-DAA period, there was an estimated 39% reduction in HCV incidence in the broad DAA access period among males (IRR=0.61, 95%CI=0.45–0.83) and a similar reduction among females (IRR pre vs broad among females=0.66, 95%CI=0.43–1.02, IRR male vs female in broad=0.73, 95%CI=0.49–1.08).

Conclusion: Overall, HCV incidence declined during the broad DAA access period for both males and females. Before DAAs, we found weak evidence for higher HCV incidence in males. Our findings demonstrate a similar reduction in HCV incidence by DAA availability for both males and females, suggestive of a treatment-as-prevention effect independent of sex.

Burnet Institute Prize for Infectious Diseases Research

Infectious syphilis test uptake and positivity among Australian women ever prescribed opioid agonist therapy

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Background: Increasing syphilis transmission among women is a growing concern. Injecting drug use has been associated with syphilis incidence, yet Australia's Sexually Transmissible Infections Strategy does not consider people who use drugs a 'priority population'. To inform integrated care and targeted testing and prevention, we estimated testing uptake and positivity for infectious syphilis among women attending primary care services ever prescribed opioid agonist therapy (OAT), compared to those never prescribed OAT.

Methods: Consultation, OAT and syphilis test data were extracted from a sentinel surveillance network of general practice, community health and alcohol and other drug services (n=25) for women aged 15–55 years between 2014–2024. We calculated test uptake (number individuals tested/number attending) and test positivity (number diagnoses/tests) for infectious syphilis, stratified by evidence of ever being prescribed OAT (a proxy for ever injecting drugs). Associations between test positivity and OAT prescription were explored using logistic regression, adjusted for age and Indigenous status.

Results: Among 257,527 women, 5,693 (2.2%) were ever prescribed OAT. Of these, 1,139 (20.0%) were tested for syphilis at least once (vs 13.1% of women never prescribed OAT). Of 34,041 women tested for syphilis (median=1 test/person; IQR=1–20), 121 (0.4%) tested positive (no reinfections). OAT prescription was independently associated with greater odds of testing positive for syphilis (3.8% vs 0.2%; aOR=12.4, 95%CI: 7.8,19.8). Less than 8% of women ever prescribed OAT were tested for syphilis at least once per calendar year between 2014–2024.

Conclusion: Women ever prescribed OAT and tested for syphilis had >12 times higher odds of testing positive than women never prescribed OAT. Despite substantial increased syphilis notifications among Australian women over the observation period, annual syphilis testing rates remained low for women receiving OAT. Our findings strongly support greater integration of sexual health in models of care for people who use drugs.

Monash School of Translational Medicine Prize for Neuroscience Research

Cognitive Recovery Following Immune Effector Cell-Associated Neurotoxicity Syndrome in the first 6 Months After Chimeric Antigen Receptor T-Cell Therapy

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Aim: Chimeric antigen receptor T-cell (CAR-T) therapy has transformed the treatment landscape for relapsed and refractory haematological malignancies, and the number of indications is expected to grow. Despite its efficacy, CAR-T therapy is associated with potentially fatal toxicities, including immune effector cell-associated neurotoxicity syndrome (ICANS). Cognitive dysfunction is a common manifestation of ICANS, but it remains unclear whether patients experience long-term cognitive deficits. The primary aim of this study was to examine cognitive recovery in patients who develop ICANS.

Methods: In this prospective longitudinal study, patients treated with CAR-T therapy at The Alfred Hospital, Melbourne, underwent cognitive testing at pre-infusion and three- and six-months post-infusion. Psychometric tests measured attention, processing speed, visuospatial function, language, memory, and executive function.

Results: 197 cognitive evaluations were conducted on 91 participants (62% male, mean age at infusion was 66.1 years (SD = 10.6 years)). Thirty-two (35%) patients developed ICANS. General linear mixed-effects models found no evidence for an interaction between time and ICANS group for most psychometric test z-scores, except for a single test of visuospatial function ($p = .007$). Patients in the ICANS group demonstrated a decline on this test relative to the non-ICANS group, but the magnitude of this effect was small.

Conclusion: Patients who develop ICANS demonstrate no strong evidence of significant cognitive decline in the six months post-CAR-T therapy. Our data suggests that ICANS-related cognitive impairment resolves sometime in the first three months post-CAR-T therapy in most cases. Our findings are reassuring and can help guide patient counselling, treatment decisions, and survivorship care.

Monash School of Translational Medicine Prize for Neuroscience Research

Eptinezumab is a Safe, Well-Tolerated And Effective Prophylactic Medication For Treatment-Resistant Chronic Migraine

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Objectives: To describe the real-world safety, tolerability and effectiveness of Eptinezumab for chronic migraine prevention in Australia.

Background: Eptinezumab is a relatively new medication for treatment-resistant chronic migraine prevention. It was introduced onto the Australian Pharmaceutical Benefits Scheme in August 2023, so there is limited real-world data regarding its tolerability and effectiveness.

Methods: Single centre retrospective audit of patients receiving Eptinezumab for chronic migraine prevention between 1st September 2023 and 31st December 2024. Headache characteristics were compared at baseline and three months after Eptinezumab administration. Primary outcomes were mean reductions in monthly headache days (MHD) and monthly migraine days (MMD). Secondary outcomes were mean monthly reductions in acute abortive medications, and adverse events.

Results: Of 60 patients who received Eptinezumab during the study period, a total of 54 patients with complete medical records and headache diaries were used in the statistical analysis. The majority were female (43/54, 80%) with mean age 41.72 years (SD 11.43). Three months after Eptinezumab infusion, MMD reduced from 22.98 days to 15.35 days (p value <0.001), and MHD reduced from 26.48 days to 19.24 days (p value <0.001). Acute analgesic use decreased from 16.15 days to 11.06 days (p value<0.001). The vast majority (94%, 51/54) had no immediate adverse events. Of 22 patients with 6-months post infusion data, mean MMD and MHD decreased to 10.96 days (p<0.001) and 17.78 days (p<0.001) respectively from baseline. Statistically significant reductions to both co-primary outcomes were achieved in those with pre-existing medication-overuse headache and those who had not responded to onabotulinumtoxinA, fremanezumab and galcanezumab.

Conclusions: Eptinezumab is a safe, well-tolerated migraine prophylactic that decreases monthly migraine and headache days in a small sample of Australian patients with treatment-resistant chronic migraine. Further prospective studies with larger sample sizes and longer follow up are needed to confirm preliminary findings.

Monash School of Translational Medicine Prize for Neuroscience Research

Development and Validation of a Novel Saliva Beta Hydroxy-butyrate Point-of-care Test for Ketogenic Diet Therapy

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Background: Reliable and easy-to-use methods for measuring the ketone body, beta hydroxy-butyrate are essential to support the save and effective implementation of ketogenic diet therapy for epilepsy.

Aims: (1) To determine the correlation between serum, capillary, and salivary BHB concentration, and (2) to validate the MX3 LAB Pro, an electrochemical salvia point-of-care test for BHB measurements.

Methods: This was a prospective cohort study including children aged <18 years, admitted to Shenzhen Children's Hospital for commencement of ketogenic diet therapy. Paired serum blood and saliva samples were taken on the first and last day of the seven-day admission. Each child also provided a saliva sample paired with a capillary BHB measurement using a blood ketone meter twice daily. Saliva BHB was measured using liquid chromatography mass spectrometry (LCMS), and the MX3 LAB Pro. The primary outcome was the correlation between serum and saliva BHB concentration. The secondary outcomes included correlation of capillary BHB compared with saliva BHB measured using LCMS and the MX3 LAB Pro, and degree of agreement between saliva BHB concentration measured by LCMS and the MX3 LAB Pro.

Results: Forty-two children, median age 4.5 years (IQR:1-8 years) took part in the study. A total of 71 serum and 334 capillary blood samples with paired saliva samples were available for analysis. Saliva BHB measured using LCMS strongly correlated with serum BHB (Spearman's ρ=0.910), and capillary blood BHB concentrations (Spearman's ρ=0.865). Saliva BHB concentration was 6% of serum and 7% capillary BHB concentration. The MX3 LAB Pro demonstrated excellent test-retest reliability when compared with LCMS (ICC(A,k)=0.983, 95% CI: 0.980 – 0.986).

Conclusion: Saliva BHB concentration has a strong correlation with both serum and capillary BHB concentration. The MX3 LAB Pro can accurately measure saliva BHB concentration. Saliva BHB testing may be suitable alternative method to monitor ketosis for ketogenic diet therapy.

Monash School of Translational Medicine Prize for Neuroscience Research

Predicting Sport-Related Brain Injury Via Head Kinematics, Finite Element Modelling, and Biomarkers

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Identifying head impacts that carry a risk of concussion in sport remains challenging. Current screening relies on witnessed events, observable signs, or self-reported symptoms, which may not reflect the presence or severity of underlying brain injury. Instrumented mouthguards quantify head impact kinematics, and finite element models can translate these data into estimates of brain strain that may better capture injury risk than kinematics alone. However, most studies have validated these measures against subjective clinical diagnoses rather than objective biological markers, such as blood-based biomarkers.

Aim: To investigate the associations between head kinematics measured by instrumented mouthguards, finite element-modelled brain strain, and plasma biomarkers of brain injury in male amateur Australian football players.

Methods: Instrumented mouthguards recorded peak linear acceleration, peak rotational acceleration, and peak rotational velocity. Whole-brain strain was estimated using the Imperial College finite element model. Plasma biomarkers included glial fibrillary acidic protein (GFAP; astroglial injury) and neurofilament light (NfL; axonal injury). Analysis included 41 video-verified impacts from male amateur Australian football players: 17 resulting in concussion, five assessed but cleared, and 19 not requiring assessment. Relationships were examined using Spearman's correlations and linear regression.

Results: Overall, GFAP was moderately correlated with peak linear acceleration (ρ=0.46, 95%CI:0.19–0.65), peak rotational velocity (ρ=0.53, 95%CI:0.22–0.78), and brain strain (ρ=0.59, 95%CI:0.27–0.80). Among concussion cases, stronger associations were observed for brain strain (ρ=0.82, 95%CI:0.48–0.95) and rotational velocity (ρ=0.64, 95%CI:0.19–0.91). NfL showed no unadjusted correlations, but regression revealed associations with rotational velocity (β=0.54, 95%CI:0.27–0.80) and brain strain (β=0.43, 95%CI:0.15–0.73).

Conclusion: Peak rotational velocity and finite element brain strain appear to outperform acceleration metrics in predicting brain injury risk. Stronger associations in concussion cases are consistent with a biomechanical threshold for injury and support the use of strain-informed measures in future risk modelling and development of screening thresholds.

Monash School of Translational Medicine Prize for Neuroscience Research

Changes In mRNA Expression of Neuroinflammation-Related Genes in the Temporal Lobe of Patients with Drug-Resistant Focal Epilepsy

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Background: Drug resistant temporal lobe epilepsy (DRTLE) is inadequately treated with current treatment paradigms. To improve patient outcomes, treatments that focus on different pathological pathways are warranted. We characterised alterations in neuroinflammation-related mRNA levels to aid the identification of possible molecular mediators of DRTLE.

Methods: Temporal lobe tissue from seventeen DRTLE patients (mean age: 46.3±12.8 years; female: 35.3%) and twelve postmortem controls (mean age: 56.1±6.1 years; female: 33.3%) were used. Reverse transcription-quantitative PCR of 60 genes of interests was performed on BioMark Fluidigm custom made gene expression integrated fluidic circuits and cycle threshold values obtained and analysed using the 2^{-DDCT} method. Correlation with various clinical parameters was assessed.

Results: Numerous 'pro-inflammatory', complement, inflammasome and microglia/monocyte related genes were upregulated in the brain specimens derived from TLE patients. Compared to controls, TNF and CCL3 had the greatest fold change of 52.7 ($p<0.0002$) and 68.9 ($p<0.0001$) respectively. C3 was increased by 5.9-fold ($p<0.0001$). IL1B and IL18, inflammasome related products, were increased 6.4 ($p<0.0001$) and 5.2 ($p<0.0001$) times respectively compared to control. Microglial markers TMEM119 and P2RY12 had a 7.1- ($p<0.0001$) and 5.9 ($p<0.0001$)-fold increase respectively with overall lower, but significant, increases in more general mononuclear cell associated mRNA. In contrast, there was only low-level upregulation of T cell and B cell associated mRNA constructs (CD38, CD27, CD3 and CD4) of between 1.5-4.2 fold ($p=0.03$ to <0.0001). No correlation between mRNA alterations and clinical parameters such as preoperative seizure frequency, number of antiseizure medications, cognitive testing and surgical outcomes was found in this relatively homogenous group.

Discussion: This study suggests that proinflammatory mechanisms may play a role in DRTLE. Complement, inflammasome and microglial/mononuclear cell mediated inflammatory processes were most altered compared to B and T cell related mediators. Our findings suggest interventions targeting these pathways should be evaluated for the treatment of DRTLE.

Monash School of Translational Medicine Prize for Neuroscience Research

Impact of Age of Onset on Relapse Activity and Disability Accrual in Neuromyelitis Optica Spectrum Disorder

Pakeeran Siriratnam, Vilija Jokubaitis, Anneke Van der Walt, Paul Sanfilippo, Chao Zhu, Saif Huda, Helmut Butzkueven, Mastura Monif

Prior studies in aquaporin-4 antibody positive neuromyelitis optica spectrum disorder (AQP4-IgG NMOSD) have reported inconsistent findings regarding the impact of age of onset on relapse risks, however there is general consensus that older disease onset is linked to more rapid disability progression.

Aim: We aimed to study the influence of age of onset on relapse risk as well as disability progression in a large, international cohort of AQP4-IgG NMOSD patients.

Methods: A retrospective multi-centre cohort study was conducted using the MSBase data registry to evaluate annualised relapse rates (ARR), time to first relapse and time to estimated disability status scale (EDSS) scores of 4 and 6. Patients were stratified based on their age of onset as paediatric onset (<18 years), early onset (18-55 years inclusive) and late onset (>55 years). Analyses were conducted separately for patients on high-efficacy therapy (HET), low efficacy therapy (LET). An incident cohort analysis was also performed for the cohort where the first clinical visit was within 12 months from disease onset.

Results: 539 patients (42 paediatric, 421 early onset, 76 late onset; 85.2% female) with a median disease duration of 7.4 years (Q1 3.23, Q3 13.1) were included. ARR and time to first relapse were not influenced by age of disease onset. Patients on HET had fewer relapses than those on LET ($p<0.001$). Patients at older age at onset experienced faster disability progression. Furthermore, higher baseline EDSS and delayed treatment were independent predictors of future disability worsening.

Conclusion: This international study using multiple statistical approaches did not identify age of onset as impacting relapse risk, however older onset patients experienced more rapid disability accrual. Our findings strongly advocate for early initiation of HET in patients regardless of their age of onset, with an emphasis on older onset patients to prevent disability worsening.

Monash School of Translational Medicine Prize for Neuroscience Research

Acute and Longitudinal Magnetic Resonance Imaging Abnormalities in Antibody-Mediated Encephalitis

Nabil Seery, Paul Beech, Robb Wesselingh, Mark Schoenwaelder, James Broadley, Laurie McLaughlin, Tiffany Rushen, Liora ter Horst, Andrew Duncan, Tracie Tan, Christina Kazzi, Genevieve Skinner, Cassie Nesbitt, Katherine Buzzard, Wendyl D'Souza, Yang Tran, Anneke Van Der Walt, Amy Halliday, Mirasol Forcadela, Bruce Taylor, Andrew Swayne, Amy Brodtmann, David Gillis, Ernest G Butler, Tomas Kalincik, Udaya Seneviratne, Richard Macdonell, Sudarshini Ramanathan, Stefan Blum, Charles B Malpas, Stephen W Reddel Todd A Hardy, Terence J. O'Brien, Paul Sanfilippo, Helmut Butzkueven, Mastura Monif

Background: Brain magnetic resonance imaging (MRI) abnormalities are an important finding in the evaluation of patients with suspected autoimmune encephalitis (AE). There have been few studies evaluating the frequency and prognostic significance of MRI abnormalities, especially hippocampal swelling, in anti-N-methyl-D-aspartate receptor (NMDAR) and anti-leucine-rich glioma-inactivated 1 (LGI1) Ab-mediated encephalitides.

Methods: Adult patients with confirmed antibody-mediated encephalitis and at least one MRI scan were prospectively and retrospectively recruited from ten Australian hospitals (n=139). MRI scans were evaluated by a neuroradiologist blinded to the specific AE diagnosis. We evaluated associations between acute MRI abnormalities (e.g., hippocampal swelling) with 12-month function (modified Rankin scale, mRS ≥2 = worse outcome) and radiological findings.

Results: In patients with anti-LGI1 Ab-mediated encephalitis, hippocampal swelling on initial MRI was associated with worse function at 12 months (OR 0.03; 95% CI 0.003, 0.34; p = 0.005). Initial AE-associated T2/fluid attenuated inversion recovery (FLAIR) hyperintensities were not associated with 12-month mRS in either the anti-NMDAR (OR 0.39; 95% CI 0.04, 3.97; p = 0.42) or anti-LGI1 Ab-mediated encephalitis groups (OR 0.34; 95% CI 0.07, 1.57; p = 0.17). In anti-LGI1 Ab-mediated encephalitis, both hippocampal swelling (OR 5.76; 95% CI 1.14, 29.01; p = 0.03) and T2/FLAIR hyperintensity (OR 8.97; 95% CI 1.65, 49.01; p = 0.01) were related to the development of mesial temporal atrophy and hippocampal sclerosis.

Conclusions: Acute hippocampal swelling is associated with worse outcomes in anti-LGI1 Ab-mediated encephalitis and, alongside initial T2/FLAIR hyperintensity, is associated with the development of both mesial temporal atrophy and hippocampal sclerosis.

Monash School of Translational Medicine Prize for Neuroscience Research

Nine-Year Longitudinal Analysis of Changes in Astrocytic and Neurodegenerative Biomarkers in Neuromyelitis Optica Spectrum Disorder

Pakeeran Siriratnam, Cordelia Dunai, Franklyn Nkongho, Samantha Linaker, Robb Wesselingh, Anneke van der Walt, Vilija Jokubaitis, Helmut Butzkueven, Mastura Monif, Benedict Michael, Saif Huda

Although progression independent of relapse activity (PIRA) is not clinically observed in aquaporin-4 positive neuromyelitis optical spectrum disorder (AQP4-IgG NMOSD), ancillary studies suggest some patients experience a progressive disease course.

Aim: To assess if there is evidence of neuronal and astrocytic damage in NMOSD

Methods: In this retrospective longitudinal cohort study from a specialist referral centre for NMOSD in the UK, serum samples of 40 NMOSD patients (162 samples) and 28 age, sex and body mass index matched healthy controls were analysed. Using single-molecule array assays (Simoa), longitudinal changes in glial fibrillary acidic protein (GFAP), neurofilament light chain (NfL), GFAP/NfL, ubiquitin C-terminal hydrolase L1 (UCHL1) and tau during relapse-free periods were measured.

Results: NMOSD patients had a median disease duration of 16.4 years (Q1 12.7, Q3 23.2), with samples collected over a median of 9 years (Q1 7.6, Q3 9.4). After adjusting for age, sex and time, NfL levels declined by approximately 2% per year (p=0.01). None of the other makers changed over time during the course of the disease: GFAP (mean 112 pg/mL +/- 65.2 to 107 pg/mL +/- 53.5, p=0.25), GFAP/NfL (mean 10.1 pg/mL +/- 5.8 to 8.9 +/-4.4, p=0.43), tau (median 0.40 pg/mL, Q1 0.25, Q3 0.57 to 0.44 pg/mL, Q1 0.3, Q3 0.72, p=0.52) and UCHL1 (median 10.3 pg/mL, Q1 4.5, Q3 19.2 to 12.1 pg/mL, Q1 6.0, Q3 25.4, p=0.38). Subgroup analysis demonstrated that high- efficacy therapy was associated with reductions in GFAP and NfL over time, whereas low- efficacy therapy showed no significant changes for any biomarker.

Conclusion: In this 9-year longitudinal biomarker study, the longest to date in NMOSD, no progressive elevations in serum biomarkers of neuroaxonal or astrocytic injury were observed, suggesting that, with these biomarkers, there is no evidence of ongoing neuronal or axonal injury outside of clinical relapses.

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Monash School of Translational Medicine Prize for Neuroscience Research

Development of the Predictive Resnet for Surgical Outcome Classification using PET Hypometabolism and Excised Tissue (PROPHET): A multimodal deep learning tool to predict surgical outcome in patients undergoing epilepsy surgery

Courtney MR, Lukies D, Kakimallaiah L, Mishra D, Karunaratne S, Neal A, Nicolo J, Kwan P, Law M, O'Brien TJ, Vivash L,and Sinclair B.

Objective: While neuroimaging offers population-level prognostic insights into seizure freedom following epilepsy surgery, it is difficult to estimate an individual's risk. This study aimed to develop and validate a deep-learning model to predict seizure outcome following epilepsy surgery.

Methods: In this large, retrospective, international, multi-centre study (n=515, 65.2% seizure free), we collected pre- and post-operative MRI, ^{18}F-FDG-PET and surgical outcome at 12-months following epilepsy surgery. Imaging data were pre-processed using SPM-12 and split 70/15/15 training/validation/testing of a ResNet convolutional neural network (CNN) model, PROPHET, to predict seizure outcome. To visualise imaging features driving model predictions, we implemented gradient-weighted class activation mapping (Grad-CAM). Grad-CAMs were visually inspected, blinded to predicted/true labels, and saliency was found to be ipsilateral, bilateral or contralateral to the resection region. Laterality categories were then calculated automatically by computing the proportion of activation in each hemisphere, generating an asymmetry index, and thresholding at ±0.15. A preliminary external validation was performed on a small cohort (n=22) from 2 held out sites.

Results: PROPHET performed poorly (AUC 0.46, F1 0.72) on the internal test cohort, achieving chance-level classification performance. However, we found a dramatic difference in PROPHET's discriminative performance based on the laterality of Grad-CAM saliency, with the ipsilateral subgroup (n=50/77, AUC 0.89, F1 0.92) achieving excellent classification performance compared to bilateral and contralateral subgroups (AUCs 0.00 and 0.02 respectively). These results were replicated in the external validation cohort (overall AUC 0.40, F1 0.80; ipsilateral saliency AUC 0.92, F1 0.91).

Conclusion: This study presents the largest, international, multicentre neuroimaging-based deep-learning model of epilepsy surgery outcome prediction. PROPHET demonstrated chance-level overall discrimination, likely due to overfitting. However, visualisation of model saliency identified a subgroup in which PROPHET performed well. Future work will explore technical solutions for overfitting, such as expanding the dataset through federated learning and use of alternative architectures.

Monash School of Translational Medicine Prize for Neuroscience Research

Exploration of an Objective Measure of Cognitive Fatigability in Multiple Sclerosis Using the MSReactor Digital Platform

Alexander Sarossy, Melissa Gresle, Chao Zhu, Yi Chao Foong, Jeannette Lechner-Scott, Michael Barnett, Tomas Kalincik, Bruce Taylor, Katherine Buzzard, Nevin A John, Allan Kermode, David Darby, Helmut Butzkueven, Anneke Van Der Walt, Daniel Merlo

Background: Cognitive fatigability (CF) affects many with Multiple Sclerosis (MS), yet measurement remains challenging due to poor correlation with subjective fatigue reports. MSReactor cognitive screening platform offers potential for objective CF assessment, particularly for longitudinal monitoring in clinical settings.

Objective: To determine whether changes in error rates during sustained cognitive testing provide a platform for studies investigating CF and its relationship to disease progression.

Methods: Adults with relapsing-remitting and secondary-progressive MS were recruited from seven Australian tertiary MS clinics. Participants completed MSReactor cognitive testing battery: a simple reaction time, a choice reaction time, and a One back test (OBK, which is a measure of working memory). Each test required participants to make 32-35 responses to stimuli appearing on screen. CF was quantified as a sustained doubling of incorrect responses in the last third compared to first third of OBK test. Expanded Disability Status Scale (EDSS) was assessed as part of standard care.

Results: Among 925 participants (mean age 43.1 years, 75% female), 176 (19%) demonstrated sustained error doubling over median 890 days follow-up. Cognitive fatigability correlated with increased activity impairment scores (p=0.05). Of 176 participants with error increases, 38 subsequently developed confirmed disability progression, suggesting largely independent disease processes.

Conclusions: This study explores MSReactor as an objective measure of CF in MS. We identified a group of participants who consistently made more errors in latter third of a sustained working memory test, which appeared independent of future disability progression. Further research is needed to validate this finding against clinical correlates and work productivity.

Monash School of Translational Medicine Prize for Neuroscience Research

Optimal Strategy for Treatment Discontinuation in Myelin Oligodendrocyte Glycoprotein Antibody-Associated Disease

Yeh WZ, Francis A, Butzkueven H, Geraldes R, Leite MI, Palace J

Myelin oligodendrocyte glycoprotein antibody-associated disease (MOGAD) is a recently defined autoimmune disease of the central nervous system. Relapse rates appear to be highest after onset and decrease over time. Studies suggest ≥3 months of steroids reduces relapse risk after a single attack. It has been proposed that treatment discontinuation could be considered in stable relapsing disease. Data is lacking regarding how long to treat and outcomes after discontinuation.

Aim: To investigate relapse outcomes following immunomodulatory treatment discontinuation.

Methods: We included Oxford National NMO Service MOGAD patients with ≥1 year disease duration, available attack and treatment data, and who started and discontinued maintenance treatment. Primary outcome was time-to-relapse post-discontinuation. Multivariable Cox regression with cluster-robust standard errors was used.

Results: 190 MOGAD patients with 236 discontinued treatment intervals were included. Median onset age was 31.5 years (IQR 16.2-41.9) and disease duration was 4.9 years (2.5-8.2). 63.6% of discontinuations were after a single attack and 36.4% were in patients with a relapsing course. After a single attack, oral steroids alone were used in 93%. In relapsing patients, steroid-sparing agents were used in 29%, most commonly azathioprine or mycophenolate.

Relapse followed 39% of discontinuations at a median 5.4 months (1.4-20.1) after cessation. Analysis showed a relapsing course at discontinuation doubled the relapse hazard (HR 1.95 [95% CI 1.25-3.06], p=0.003). Timing of acute treatment of onset attack did not influence relapse risk. Treatment durations ≥3 months were significantly protective against relapse compared to 3 months. We estimated optimal treatment durations before discontinuation could be considered of 10-18 months after a single attack and 20-30 months for stable relapsing patients.

Conclusion: Our results provide evidence to inform joint clinician-patient decision-making and to guide how long to treat before discontinuation could be considered in a stable patient which minimises relapse risk after discontinuation.

Monash School of Translational Medicine Prize for Neuroscience Research

Treating Multiple Sclerosis in Cancer Survivors: Understanding the Influence of Cancer Chemotherapy

Cassie Nesbitt

Background + Objective: As more individuals with multiple sclerosis (MS) survive cancer, guidance on disease-modifying therapy (DMT) use in the context of cancer treatment is increasingly relevant. This study examines real-world treatment decisions in individuals with both diagnoses, focusing on how chemotherapy and DMT exposure relate to relapse risk and disability progression, and whether chemotherapy itself influences MS outcomes.

Methods: We conducted a retrospective cohort study using data from the MSBase registry. Time-to-event analyses evaluated relapse and 6-month confirmed disability progression (CDP), modelling DMTs as time-varying covariates. Outcomes were compared using 2:1 propensity score matching (PSM) between individuals with MS receiving chemotherapy and matched MS controls. Matching was performed with an exact match on age at cancer diagnosis (or matched visit), and nearest neighbour matching with a caliper of 0.05 for calendar year at cancer diagnosis, age at MS onset, EDSS at the time of cancer, relapse rate in the 24 months prior to cancer, and cumulative DMT exposure. A breast cancer subgroup was analysed separately.

Results: 364 individuals with MS and cancer treated with chemotherapy were prospectively followed for a median 2.8 years post-cancer. Age was inversely associated with relapse risk (HR 0.90 per year, $p < 0.001$). DMT exposure post-chemotherapy did not significantly alter relapse risk or CDP. Chemotherapy was associated with a time-dependent reduction in relapse risk during the first-year post-treatment (0–6 months: HR 0.35, 95% CI: 0.17–0.75; 6–12 months: HR 0.39, 95% CI: 0.17–0.87), which was not sustained after 12 months. In the breast cancer subgroup (n=172) median follow-up was 3.9 years. Analyses demonstrated reduced relapse risk in those receiving chemotherapy relative to matched controls (HR 0.58, 95% CI: 0.37–0.95). Proportional hazards held in this subgroup.

Conclusion: Chemotherapy was associated with a relapse risk reduction compared to standard MS therapy, although, this effect may be time-limited based on the regimen used. This aligns with real-world observations, where DMTs were often withheld or de-escalated after cancer diagnosis. DMT reinitiation decisions should consider individual risk profiles and cancer regimens, with reinitiation potentially less indicated in older individuals.

Monash School of Translational Medicine Prize for Neuroscience Research

Unpacking the Associations Between Adverse Childhood Experiences and Intimate Partner Violence-Caused Brain Injury

Abigail Astridge, Eveline Mu, Charlotte Copas, Olivia Hannon, Beatrice Duarte Martins, Christine Padgett, Gershon Spitz, Jennifer Makovec Knight, Stuart J. McDonald, Zhibin Chen, Emily Edwards, Silke Meyer, Sandy R. Shultz, Georgia F. Symons

Adverse childhood experiences (ACE) are an established risk factor of intimate partner violence (IPV). Exposure to toxic stress can result in several consequences that increase the risk of adult IPV. Physical IPV can result in brain injuries (BI), which are often overlooked despite the possible long-term consequences like persistent post-concussive symptoms (PPCS) and post-traumatic stress-disorder (PTSD). Little is known about the link between ACEs and IPV-BI, which can help aid treating and supporting victim-survivors. Therefore, we aim to understand the associations between ACEs and IPV-BI as well as PPCS, PTSD, depression, and resilience.

Methods: We recruited 170 community-dwelling women aged 18-75 as part of an Australian study investigating IPV-BI. Participants completed questionnaires to categorise ACE, IPV, and BI, and questionnaires related to PTSD, depression, and resilience symptoms. Regression analyses were run to determine relationships.

Results: Higher ACE scores increased the odds of reporting IPV-related mild traumatic BI (mTBI), IPV-related head impacts (IPV-HI), non-fatal strangulation-related BI (NFS-BI), and NFS experiences. Increased ACE scores were associated with probable PTSD and depression. Additionally, ACE subtypes childhood physical/sexual abuse predicted NFS experiences; emotional abuse/neglect predicted IPV-mTBI, IPV-HI, NFS, and non-IPV-BI (i.e., sports-related); adverse family conditions (e.g., familiar substance misuse) predicted IPV-mTBI, IPV-HI, NFS experiences; and childhood experiences of domestic violence predicted IPV-mTBI, IPV-HI, and NFS experiences. ACE scores and each subtype predicted PTSD, only ACE scores and childhood emotional abuse/neglect predicted depression. ACE scores and all subtypes, apart from adverse family conditions, predicted PPCS severity. Only emotional abuse/neglect was associated with lower levels of resilience.

Conclusion: Increasing screening and awareness of ACEs in IPV and TBI clinics will help to inform treatment. These findings highlight the need for preventative efforts aimed at reducing childhood adversity and strengthening social support services to help mitigate long-term impacts.

Monash School of Translational Medicine Prize for Neuroscience Research

Predictors of Relapse and Disability Progression After Pregnancy in Women with Moderately Severe Multiple Sclerosis Disability

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Introduction: Understanding the impact of pregnancy on clinical outcomes in women with more advanced multiple sclerosis (MS) disability is crucial for guiding family planning and management strategies.

Aim: To assess peri-pregnancy annualised relapse rates (ARRs) and time to 6-month confirmed disability worsening (CDW) in women with a preconception Expanded Disability Status Scale (EDSS) score of 3 or higher.

Methods: This multicentre observational cohort study utilised data from the MSBase Registry. Study cohorts comprised pregnant women with MS with a preconception EDSS score ≥3 and propensity score-matched non-pregnant MS controls.

Results: 575 women with MS were included in the pregnant cohort and 1,056 in the non-pregnant cohort. Relapse activity decreased during pregnancy, with a 75% reduction in ARR during the first trimester (rate ratio [RR], 0.25; 95% CI, 0.15-0.43),and increased to 36% above preconception rates in the first three months postpartum (RR, 1.36; 95% CI, 1.06-1.75). Relapse during pregnancy was associated with a higher preconception ARR (odds ratio [OR], 1.56; 95% CI, 1.10-2.20) and preconception use of natalizumab (OR, 4.42; 95% CI, 1.24-23.57) or fingolimod (OR, 14.07; 95% CI, 2.81-91.3). Older age (OR, 0.92; 95% CI, 0.85-0.99) and continuation of disease-modifying therapy (DMT) into pregnancy (OR, 0.42; 95% CI, 0.19-1.00) reduced the risk. Early postpartum relapse was mitigated by DMT reinitiation within one month postpartum (OR, 0.45; 95% CI, 0.23-0.86). There was no significant difference in time to CDW between the pregnant and non-pregnant groups (hazard ratio [HR], 1.15; 95% CI, 0.96-1.38). However, ARR during pregnancy (HR, 1.37; 95% CI, 1.13-1.65) and postpartum EDSS >4 (HR, 2.69; 95% CI, 1.80-4.03) were associated with shorter time to CDW.

Conclusion: Women with more advanced MS disability exhibit similar peripartum relapse activity as those with lower disability. Pregnancy is not associated with worse long-term disability outcomes, although optimising peri-pregnancy disease control remains critical.

Monash School of Translational Medicine Prize for Neuroscience Research

Enlarged Perivascular Spaces as a Biomarker of Disease in Progressive Supranuclear Palsy

Cassandra Marotta, Benjamin Sinclair, Terence J O'Brien, Lucy Vivash

Objectives: Perivascular spaces, a component of the glymphatic system are involved in clearing waste from the extracellular space in the brain. Enlarged PVS (ePVS) are indicative of glymphatic impairment and are visible on structural MRI, allowing for quantification. This study aimed to investigate the potential use of ePVS as a biomarker of disease in PSP Richardson syndrome (PSP-RS).

Methods: Using an automated algorithm developed in house we segmented ePVS on MRIs in 15 PSP-RS subjects. The density of ePVS in the white matter (WM) and basal ganglia (BG) were associated with the PSP rating scale (PSPRS), disease duration, CSF total tau (t-tau), glial fibrillary acidic protein (GFAP) and neurofilament light chain (NfL) using Spearman's correlation.

Results: WM ePVS correlated strongly with CSF NfL ($r=0.59$, $p<0.04$) and t-tau ($r=0.66$, $p<0.02$), however there was a negative correlation with disease duration ($r=-0.69$, $p<0.005$). The correlations with t-tau and disease duration survived correction for multiple comparisons. Disease duration was also found to have a moderate negative trend with NfL ($r=-0.3$, $p=0.31$). No associations with BG ePVS or PSPRS scores were observed.

Conclusions: This study suggests that WM, but not BG ePVS may have potential as a biomarker of disease in PSP. The positive association between ePVS and NfL may indicate that ePVS may also be a measure of neurodegeneration. The negative relationship between both NfL and ePVS with disease duration may suggest that these measures are indicative of more aggressive disease. Further research should investigate ePVS in a longitudinal cohort to determine if ePVS impact progression rates in patients with PSP.

Monash School of Translational Medicine Prize for Neuroscience Research

Towards Clinically Meaningful Cognitive Monitoring: Preliminary Reliable Change Analysis Using MSReactor

Daniel Merlo, Melissa Gresle, Chao Zhu, Yi Chao Foong, Jeannette Lechner Scott, Michael Barnett, Tomas Kalincik, Bruce Taylor, Katherine Buzzard, Nevin A John, Allan Kermode, David Darby, Helmut Butzkueven, Anneke van der Walt

Changes in cognition are a common and debilitating symptom in people living with multiple sclerosis (pwMS). Subtle changes in cognitive function are difficult to measure with traditional cognitive tests. Digital tools that are sensitive to changes in broad cognitive domains have been translated for clinical settings. The MSReactor tests are repeatable and sensitive to subtle changes in cognitive function. However, information on what constitutes a relevant change over time in these tests is unknown.

Aim: To determine reliable change (RC) for the MSReactor digital cognitive platform.

Methods: The MSReactor platform comprises 3 reaction time-based tests measuring information processing speed (SRT), attention (CRT) and working memory (OBK). Participants completed tests 6 monthly in clinic with the option of additional remote testing. Change over 12- and 18-months follow-up was used to calculate RC, defined as the change in score divided by the standard error of the difference for each of the MSReactor tests. Reliability of the MSReactor tests was set at 0.80. RC was compared across disability levels.

Results: We included data from 549 pwMS. At 12 months, 14% of participants had reliably deteriorated in the SRT task; 12.5% on the CRT task; and 9% on the OBK task. At 18 months, 19.2% of participants had reliably deteriorated in the SRT task; 13% on the CRT task; and 8.5% on the OBK task. In all tests, the higher EDSS groups had greater numbers of reliably deteriorating participants.

Conclusion: Significant RC could be detected in MSReactor tasks over 12 and 18 months, with the processing speed task being most sensitive to change. Higher levels of EDSS had a greater proportion of participants who were reliably worsening on all tasks. This preliminary analysis defines important RC thresholds for translation of a digital cognitive test to routine cognitive monitoring in MS care settings.

Monash School of Translational Medicine Prize for Neuroscience Research

Aerobic Exercise as an Intervention for Mental Health Challenges and Persistent Post-Concussion Symptom Severity in Community Dwelling Women with a History of Intimate Partner Violence: A Preliminary Analysis

Charlotte Copas, Abigail D Astridge, Beatrice Duarte Martins, Jennifer Makovec Knight, Stuart McDonald, Sandy R Shultz, Georgia F Symons

Background: Women who experienced intimate partner violence (IPV) frequently endure psychological violence and physical violence, including mild traumatic brain injuries, placing them at risk for post-traumatic stress disorder (PTSD), depression, and anxiety, as well as persistent post-concussion symptoms (PPCS). Aerobic exercise (AE) has shown promise in alleviating mental health symptoms when paired with psychological interventions, and in controlling PPCS symptoms in adolescents with sports-related concussions. However, there are very few clinical trials exploring the effectiveness of AE as a standalone intervention for mental health, and no trials investigating its utility for PPCS in IPV victim-survivors.

Objective: This study aimed to determine if preliminary results from a 4-week AE intervention or stretching intervention affected PTSD, depression, anxiety, and PPCS symptoms in community-dwelling women at least 3 months after the last IPV occurrence. Heart rate variability, safety, feasibility, and adherence were also assessed.

Methods: Women aged 18-70 were recruited through the placement of flyers in the general community of Melbourne, Australia. A total of 15 participants completed either a 20-minute/day 4-week AE/STAE or stretching intervention. PTSD symptoms were measured by the PCL-5, depression, anxiety, and stress by the DASS-21, and PPCS by the RPQ. Participants wore a Fitbit watch throughout the trial to measure heart rate variability as well as adherence to the assigned program.

Results: In this preliminary analysis we show that the majority of participants completed all follow-up sessions, with only two reporting any adverse events due to the intervention, making this treatment feasible and safe. Adherence to daily exercise or stretching was also high. There were no significant changes in PTSD, depression, anxiety, stress, or PPCS scores within or between treatment groups.

Conclusions: Overall, a 4-week AE/STAE intervention is feasible and safe; however, preliminary results suggest it may not be efficacious beyond an adjunct to traditional psychotherapy and/or pharmacological interventions within this population.

Monash School of Translational Medicine Prize for Neuroscience Research

Supervised Machine Learning for Estimating Peak Oxygen Consumption in Stroke Individuals Using Submaximal Total-Body Recumbent Stepper Exercise Test

Mohamed Salah Khlif, Kimberley Adkins, Stephanie Tucker, Liam Johnson, Sharon Kramer, Amy Brodtmann

The gold standard measurement of cardiorespiratory fitness (CRF) is the maximal volume of oxygen consumed (VO_{2max}) during a graded exercise test (GXT). However, VO_{2max} testing is often clinically impractical due to test difficulty and personnel and equipment costs. Peak volume of oxygen consumption (VO_{2peak}) offers a practical alternative to VO_{2max}.

Aim: to understand the VO_{2peak} response to changes in demographic, anthropometric, and submaximal GXT variables in stroke survivors via machine learning VO_{2peak} modelling.

Methods: Ten supervised machine learning regression models estimated VO_{2peak} in 32 individuals with submaximal GXT at 2-, 4-, and 12-months following ischemic stroke (total observations=80). Input variables included age, sex, weight, workload, and heart rate. Separate 4-fold cross-validations were used for model parameter optimization and for evaluating prediction performance using root mean square error (RMSE), correlation (R^2), Lin's concordance correlation coefficient (CCC), and Bland–Altman plots.

Results: Best prediction performance was equally achieved by support vector machine (SVM) and Gaussian Process (GP) regression models (RMSE=2±0.1 ml/kg/min, R^2 =0.90±0.01, CCC=0.95 [0.92-0.97]). Bland–Altman plots showed no prediction bias. Workload as input variable was identified as the most important determinant of VO_{2peak} in all models. In this stroke cohort, VO_{2peak} was found to be higher in men, negatively associated with age and weight, and positively associated with both workload and heart rate.

Conclusions: SVM and GP models outperformed other regression methods in predicting VO_{2peak} based on submaximal GXT of people with stroke. The positive association between VO_{2peak} and heart rate is important for future testing of stroke survivors.

Monash School of Translational Medicine Prize for Neuroscience Research

Post-Ischaemic Stroke Cardiovascular Exercise Study – Zoom Delivered Intervention Against Cognitive Decline (Pisces-Zodiac): A Multicentre, Prospective, Randomised, Blinded-Endpoint, Controlled Phase 2B Trial of Fitness Training for Brain Health

Brodtmann A, Churilov L, Adkins K, Haibe R, Tucker S, Khlif MS, Werden E, McCambridge LJE, Telfer R, Kramer S, Cardoso BR, Pase M, Launder N, Egorova-Brumley N, Hung SH, Burrell LM, Williams G, Thijs V, Bernhardt J, Johnson L, Hayward KS

Stroke increases risk of cognitive impairment and dementia without proven prevention therapies. Cardiorespiratory exercise preserves brain health.

Aim: Test the effects of an 8-week cardiorespiratory exercise intervention on hippocampal volume and cognition in ischaemic stroke survivors.

Methods: We conducted a multicentre Phase 2b assessor-blinded randomised controlled trial at four healthcare services in Melbourne, Australia. Participants were assessed with brain MRI and cognitive testing before (2 months post-stroke, t_1) and after (4 months, t_2) intervention, and at follow-up (12 months, t_3). Participants were randomised (1:1) stratified by baseline function (modified Rankin Scale, mRS, 0-1 versus 2-3) and total brain volume. Cardiorespiratory exercise participants received prescribed intensity progressive aerobic and resistance training; control participants received balance and stretching training. The primary outcome was relative hippocampal volume change (HV; (HVt_1-HVt_2)/HVt_1). Primary, secondary efficacy and safety outcome analyses were conducted using modified intention-to-treat (mITT) principle and per protocol. Secondary outcome was t_3 executive function testing (Trial Making Test-B, TMT-B), adjusted for baseline mRS. Trial registration: anzctr.org.au ACTRN12616000942459.

Results: PISCES in-person intervention was paused for pandemic restrictions and resumed as ZODIAC remotely delivered intervention. 107 participants were randomised (34 PISCES/73 ZODIAC); 3 ZODIAC participants discontinued prior to intervention. 104 (55 control/49 cardiorespiratory) were included in the primary outcome mITT analysis (mean 64±14 years, 64% men; equivalent baseline mRS). 100 participants were assessed post intervention and 97 at follow-up. There were no serious intervention-related adverse events. Mean difference in relative HV change between cardiorespiratory (mean=-0·26%, SD2·1%) and control (mean=-0·10%, SD2·40%) groups was -0·10% (95%CI:-1·10,0·87), p=0·83. Cardiorespiratory exercise (n=43) performed better than control participants (n=51) on adjusted TMT-B at 12 months: adjusted mean difference -3·75 seconds (95%CI:-5·02,-2·49).

Conclusion: An 8-week cardiorespiratory exercise intervention was safe but did not preserve hippocampal volume more than balance and stretching. Cardiorespiratory exercise may benefit cognitive preservation following ischaemic stroke.

Monash School of Translational Medicine Prize for Neuroscience Research

Cortical Gradients Reveal Lateralised and Temporal Dynamics of Functional Connectivity After Ischemic Stroke

Nicholas Parsons, Mohamed H. Khalif, Ruwayda Habibe, Govinda R. Poudel, Amy Brodtmann

Aim: Recovery after ischemic stroke involves widespread reorganisation of functional connectivity (FC), but the spatial and hierarchical principles guiding this process remain poorly understood. We tested the hypothesis that FC reorganisation is shaped by cortical gradients, lesion laterality, and recovery stage, and that these features predict cognitive outcomes.

Methods: Resting-state fMRI was collected from 129 individuals with ischemic stroke at 3 months (subacute), 12 months (early chronic), and 36 months (late chronic). A lesion-matched, gradient-informed framework was applied to quantify longitudinal FC changes (ΔFC) along cortical gradients and their spatial dispersion. Behavioural associations were examined using Trail Making Test B performance.

Results: Stroke laterality strongly influenced recovery. Right hemisphere stroke produced widespread contra lesional increases in unimodal connectivity ($U = 2.13 \times 10^7$, $p < 0.001$), while left hemisphere stroke showed ipsilesional reductions in trans modal cortices. These differences persisted across recovery and were consistently organised along Gradient 1 (unimodal-to-trans modal, $H = 123.8$, $p < 0.001$) and Gradient 3 (sensorimotor-to-default mode, $H = 309.4$, $p < 0.001$). Connectivity dispersion increased over time ($\beta = 3.45$ mm, $p < 0.001$) but became more anatomically focused in late recovery ($\beta = -7.34$ mm, $p < 0.001$). Right hemisphere strokes exhibited greater dispersion ($\beta = 4.32$ mm, $p < 0.001$), suggesting hemisphere-specific compensatory mechanisms. In the chronic stage, ΔFC aligned with cortical gradients that predicted executive outcomes, including Trail Making Test B performance ($\beta = 26.3$, $p = 1.2 \times 10^{-4}$).

Conclusion: Recovery from ischemic stroke reflects systematic rerouting of communication governed by interacting rules of cortical organisation, including intrinsic gradients, hemispheric laterality, and recovery stage. This shows that the brain's architecture does not simply permit plasticity but actively shapes it, revealing a fundamental principle of neural resilience. These organising rules explain how communication pathways are reconfigured after injury.

Monash School of Translational Medicine Prize for Neuroscience Research

Impact Of High-Fat Diet on the Elasticity of Lipid Metabolism in the Hypothalamus

Adelaide Bernard, Kevin Liu, Yingying Liu, Jen Xin Fach, Hanne woo, Kevin Huynh, Natalie Mellet , Manika Singh, William Ho, Peter Meikle, Brian Drew, Yi Wang

Background: The brain is the second-most lipid-rich organ, with lipids playing essential roles in membrane formation, signalling, inflammation regulation, neurogenesis, energy storage, and protection against oxidative stress. Dysregulation of lipid metabolism is a key factor in obesity-related diseases and neurodegenerative disorders, highlighting the importance of lipid homeostasis for brain function. Despite recent advances in lipidomics technology, how brain lipid metabolism is affected by diet and the energy status of an organism remains poorly understood.

The hypothalamus regulates energy homeostasis by integrating nutrient and hormonal signals to control energy expenditure and feeding behaviour. While high-fat diets are known to disrupt hypothalamic function, whether and how they disrupt lipid metabolism in the hypothalamus remains unclear.

Methods: This study leveraged lipidomics (quantifying 750+ individual lipid species) and bulk RNA sequencing to examine the impact of short- (3 days) and long-term (8 weeks) high-fat diet on hypothalamic lipid metabolism.

Obesity has recently been shown to reduce the “metabolic elasticity” of peripheral organs, i.e. their ability to respond to energy balance disturbances and return to baseline homeostasis. We applied this concept to the hypothalamus to assess its adaptability to metabolic challenges, such as cycles of fasting and refeeding, under different diet conditions. Originally developed for transcriptome data, we extended this concept to analyse lipidome elasticity.

Results: Our findings revealed that just three days of a high-fat diet significantly altered hypothalamic elasticity, identifying pathway perturbations not evident when comparing single metabolic state snapshots in high-fat diet versus chow-fed mice.

Conclusion: Understanding the interplay between obesity, lipid metabolism and brain function is essential for developing new therapeutic strategies. This study shows that metabolic elasticity scoring offers a promising approach to identify novel pathways involved in the neurological aspects of obesity-related metabolic disorders.

Monash School of Translational Medicine Prize for Neuroscience Research

Barriers to Participation in Stroke Clinical Trials at an Australian Tertiary Neuroscience Centre: A Retrospective Analysis

Pamela Galindo Mycah Astrera-Sgro, Elaine Cheung MBBS, Vimal Stanislaus MBBS, Geoffrey Cloud MBBS

Background: Women are consistently underrepresented in clinical stroke trials, despite experiencing a higher lifetime stroke risk and poorer post-stroke outcomes. Disparities in participation may be influenced by trial type, and stroke phase. Understanding gender-specific barriers is essential to improving inclusivity and ensuring representative trial populations.

Aim: To evaluate the trend in non-participation in stroke clinical trials by gender, trial type, and onset phase.

Methods: Retrospective observational study of adult stroke patients aged ≥ 18 years, admitted to the Alfred Health Comprehensive Stroke Centre between February 2019-March 2025.

Results: Of 494 eligible stroke patients (female: 235 [47.6%]; male: 259 [52.4%]), 340 (68.8%) consented to participate, including 134/235 females (57.0%) and 206/259 males (79.5%) ($p < 0.001$). 109 patients declined (female: 63/235 [26.8%]; male: 46/259 [17.8%]), and 45 were not approached (female: 38/235 [16.2%]; male: 7/259 [2.7%]).

Declines were most frequent in interventional trials (female: 41/146 [28.1%]; male: 34/185 [18.4%], $p <0.05$), then non-interventional (female: 17/71 [23.9%]; male: 8/47 [17.0%]) and observational trials (female: 6/18 [33.3%]; male: 6/27 [22.2%]).

By onset phase, declines were highest during the acute phase (female: 31/122 [25.4%]; male: 30/141 [21.3%]), then chronic (female: 27/92 [29.3%]; male: 17/98 [17.3%]). In the hyperacute phase, declines occurred only among females (6/19 [31.6%]; male: 0/17, $p <0.01$). In the subacute phase, one male declined (1/3 [33.3%]) and no declines were recorded among females (0/2).

Conclusions: Interventional and acute-phase trials exhibit pronounced gender disparities at our centre. Female patients demonstrated significantly reduced participation. Further understanding of gender disparities in clinical stroke research trials is required.

Monash School of Translational Medicine Prize for Neuroscience Research

Electroclinical Characterisation of Secondary Hippocampal Epileptogenicity

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Rationale: Understanding hippocampal (HC) epileptogenicity is critical for surgical decision-making, even in patients with presumed extra-HC epileptogenic zones (EZ). Using SEEG, we characterised the spectrum of hippocampal involvement in drug-resistant epilepsy.

Methods: Consecutive SEEG cases with HC electrodes were reviewed and each HC categorised as: (i) Primarily Epileptogenic (PEH) if included in the EZ by multidisciplinary consensus; (ii) Secondarily Epileptogenic (SEH) if not part of the EZ but generated spontaneous sub/clinical seizures or seizures with 1 Hz stimulation; or (iii) Non-Epileptogenic (NEH) otherwise.

We computed maximal interictal spike and high-frequency oscillation (HFO) rates per HC. Each habitual seizure was reviewed to identify hippocampal onset or propagation, and in case of the last, time to involvement (TTH) and presence of fast activity (>14 Hz; FA).

Clinical/demographic comparisons were made between those with uni/bilateral SEH (SEHP) and non-SEHP, after excluding patients with unilateral HC sampling in temporal lobe epilepsy.

Results: We analysed 311 seizures from 94 HC in 58 patients: 32 PEH, 30 SEH (18 based only on stimulated seizures), and 32 NEH.
Spike and HFO rates did not differ between PEH and SEH, but the last was higher than NEH for both ($P<0.001$). Extra-HC-onset seizures were more likely to propagate ($P=0.005$) and generate FA ($P<0.001$) in SEH compared to NEH, though TTH was similar.
Of 47 eligible patients, 22 were SEHP, who had longer disease duration than non-SEHP ($P=0.014$), but otherwise similar. Untreated SEH were linked to lower seizure freedom at 6 months post-surgery ($P=0.009$).

Conclusions: Our data suggest that longer disease duration and frequent seizure propagation with fast activity promote secondary hippocampal epileptogenicity, a process established only in animal models. The electroclinical and outcome findings, relevant to a nearly half of the study population, have key implications for network formulation and SEEG analysis, requiring further validation and non-invasive predictors.

Monash School of Translational Medicine Prize for Neuroscience Research

Incidence and Circumstances of Sudden Unexpected Death in Epilepsy (SUDEP) in the Young Australian Community

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Background: We examined the contribution of sudden unexpected death in epilepsy (SUDEP) in the young Australian community using a state-wide out-of-hospital cardiac arrest registry.

Methods: All presumed out-of-hospital sudden cardiac arrests aged 1–50 years with a history of epilepsy or seizures within the ongoing, prospective, multisource End Unexplained Cardiac Death (EndUCD) registry between April 2019 and August 2022 were reviewed. Cause of death was determined by a multidisciplinary panel with expertise in SUDEP. We compared the characteristics of SUDEP cases with autopsy confirmed cardiac and unascertained deaths.

Results: The multidisciplinary panel identified 111 SUDEP cases (64 definite, 12 probable, 24 possible, and 11 fatal near) from 2625 young out-of-hospital sudden arrests (4.2%). The incidence of definite and probable SUDEP was 0.98 (95% confidence interval [CI], 0.61–2.50) per 1000 person-years. Most definite and probable SUDEPs 58/76 (76.3%) were deceased prior to ambulance arrival. Of those 18 SUDEPs who were alive upon ambulance arrival, 12 (61.1%) had asystole, 3 (16.7%) had pulseless electrical activity, and 2 (11.1%) had ventricular tachycardia and fibrillation. Most definite and probable SUDEPs were asleep 41 (53.9%) or sedentary 19 (25.0%) at the time of death, only 16/74 (21.6%) had all prescribed antiseizure medication (ASM) levels within the therapeutic range at the time of death, and only 20.8% (10/48) were seizure-free in the 12 months preceding death. SUDEP was only reported in 43/76 (56.6%) cases by pathologists.

Conclusion: SUDEP accounted for 13.8% of young sudden deaths undergoing autopsy in Victoria. Our findings reinforce that seizure control and adherence to ASM therapy are major modifiable clinical risk factors for SUDEP. The differences in attribution of cause of death between pathologists and epileptologists highlight the need for consensus and raise the possibility that an important cause of arrest may be under-appreciated.

Monash School of Translational Medicine Prize for Neuroscience Research

Predictors Of Disability Progression in a Prospective Cohort Study of Patients with Relapsing-Remitting Multiple Sclerosis (MS): The Improve-MS Cohort Study

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Background: Accurately measuring and predicting individual disability progression rates in people with Multiple Sclerosis (MS) remains challenging, largely due to a lack of quantitative clinical features, imaging characteristics, or biomarkers. In this prospective cohort study, we evaluated the performance of the Multiple Sclerosis Performance Test (MSPT, Biogen®)- which includes assessments for cognition, upper limb function and lower limb function- the MS-Reactor cognitive test, and MRI-based metrics, for predicting subsequent clinical progression.

Methods: Relapsing-Remitting (RRMS) patients (aged 18+) were recruited from six neurology clinics around Australia during 2017-2021 and followed until 2023 (mean 4.1 years). Participants completed the MSPT and MSReactor cognitive assessments at biannual reviews, and annual routine practice MRI scans (lesion numbers/volumes and whole- and regional-brain and CSF volumes). Clinical characteristics were assessed at least biannually, including Expanded Disability Status Scale (EDSS), relapse rates, and disease-modifying medication (DMT) use. We applied principal components analysis (PCA) to MSPT, MSReactor, and MRI measures obtained in the first 1.5-year observation period, deriving 7 component scores explaining 56.8% of the variance. Associations of these 1.5-year PC scores (standardised continuous and quartile categorical) with subsequent hazards of sustained EDSS increase and decrease, and cumulative hazard of relapse, were assessed using Cox proportional hazards regression, estimating adjusted hazard ratios (aHR).

Results: The sample comprised 397 RRMS patients with 1.5-year MSPT/MSReactor/MRI data for PCA. For the primary study endpoint, sustained EDSS progression during the observation period, C5 PC (reflecting 1.5-year deterioration in MSReactor cognitive performance) was the strongest and most consistent predictor, as a continuous (aHR=1.22, 95%CI=1.01-1.46) and categorical term (top vs bottom quartile, aHR=4.72, 95%CI=1.52-14.66, p_{trend}=0.002). Interestingly, neither PCs reflecting changes in MRI parameters, nor of ambulation or manual dexterity scores, were predictive of disability progression.

Conclusions: We show that cognition-based metrics may represent a useful tool for medium-term clinical prognostication in MS.

Monash School of Translational Medicine Prize for Neuroscience Research

Accounting for Practice Effects in MSReactor: Enhancing the Validity of a Computerised Cognitive Screening Tool

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Introduction: MSReactor is a brief, online cognitive screening tool for multiple sclerosis (MS). However, repeated cognitive testing introduces practice effects (PE) where test performance may improve with increased test familiarity, potentially obscuring true cognitive decline.

Aim: To investigate PE in MSReactor by comparing models with varying PE specifications, aiming to improve the detection of cognitive change in MS.

Methods: Participants with Relapsing-Remitting or Secondary-Progressive MS completed serial MSReactor testing. Longitudinal mean reaction times from the three tasks – Simple-Reaction Task (SiRT), Choice-Reaction Task (ChRT), One-Back Task (OBK) – were modelled using linear mixed-effects models with six different PE specifications; a base model with no PE, indicator variables for the first test, first two tests, first three tests, variables for the number of previous tests and the square root of the number of previous tests. Models included time in months and age as fixed effects, with intercept and slope allowed to vary between participants. Model fit was assessed using the Akaike Information Criterion (AIC). The effect of the different PE specifications on estimated rate of cognitive change was measured.

Results: A total of 835 participants were included. Median follow-up was 34 months. The optimal SiRT and ChRT models were fit with a PE indicator variable for the first test (SiRT: AIC=96739, β=+0.20 milliseconds(ms)/month) (ChRT: AIC=102378, β=+0.27 ms/month). The optimal OBK model included a PE variable for the square root of the number of previous tests (AIC=108474, β=+0.50 ms/month). Models without PE specifications all had larger AICs and negative change coefficients, indicating apparent cognitive improvement.

Conclusion: Including PE specifications improved model fit compared to models without PE adjustments. Optimal models showed a positive change coefficient – unlike base models – indicating that accounting for PE enhances the accuracy of MSReactor change estimates. These findings may support more precise detection of gradual cognitive decline in MS.

Monash School of Translational Medicine Prize for Neuroscience Research

Dornase Alpha Potentiates Clot Lysis with Tenecteplase: Insights from Ex-Vivo Lysis ff Thrombectomy Clots

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Background and Aims: Dornase alpha, a recombinant human deoxyribonuclease I, can potentiate alteplase-mediated clot lysis via breakdown of neutrophil extracellular traps. We aimed to determine if dornase potentiates clot lysis in combination with tenecteplase (TNK) using endovascularly retrieved clots and to determine how clot components interact with lytic agents in the presence of dornase.

Methods: We modified tenecteplase with a histidine tag at its C-terminal (TNK-His) to allow visualisation of TNK-His complex formation. 21 retrieved clots were divided and suspended either in buffer or pooled plasma and incubated with 15nM TNK-His alone or combination with either 10U/ml or 100U/ml of dornase. Clot weight was measured over 120-minutes. Clot lysate supernatants were then assessed for fibrinolytic activity by fibrin zymography and western blotted to detect TNK-His complex formation, changes in plasminogen, antiplasmin, fibrin degradation products (FDPs).

Results: Addition of TNK-His to retrieved clots suspended in buffer resulted in reduction to 42.9+/-29.6% (mean ± std dev) of the initial clot weight after 120-minutes. This was further reduced to 20.6+/-13.4% in the presence of 100U/ml of dornase ($p<0.01$ compared to TNK-His alone). Addition of 10U/ml of dornase reduced clot weight to 32.7±18.5% but this was not statistically significant compared to TNK-His alone. Further, incubation in plasma resulted in a clot weight reduction to 64.3+/-25.4% in the presence of TNK-His. However, there was no statistically significant reduction with further addition of Dornase to TNK-His in plasma. Western blotting revealed presence of TNK-His complexes, increase in FDPs and consumption of plasminogen and antiplasmin in the presence of dornase.

Conclusion: This study demonstrates that 100U/ml dornase potentiates TNK-His mediated clot lysis in buffer, however, this effect is reduced in plasma. TNK complex formation and increased consumption of fibrinolytic components occurs following lysis in combination with dornase compared to with TNK alone.

Monash School of Translational Medicine Prize for Neuroscience Research

The Impact of Headache in Neuro-Ophthalmology: Insights from a Multicentre Cohort Study

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Aim: To assess baseline and longitudinal self-reported impact of headache in patients with common neuro-ophthalmology disorders. We compared Headache Impact Test (HIT-6) scores between conditions and evaluated clinical and lifestyle factors predicting HIT-6 scores.

Methods: Patient data was retrieved from the Neuro-Ophthalmology Database (NODE) across The Alfred Hospital and Royal Victorian Eye and Ear Hospital from the 19th of March 2020 to the 20th of July 2023. Patients assessed the impact of headache through the HIT-6 questionnaire. Patients with multiple diagnoses were excluded. Univariate and multivariate analysis identified demographic and clinical features affecting HIT-6 scores. Longitudinal analysis was performed using a linear mixed-effects model. A diagnosis of headache was used as reference.

Results: The study included eight conditions, with multiple sclerosis (MS) (n= 77) and idiopathic intracranial hypertension (n = 99) the most prevalent. 296 patients were included (mean age of 41; 73% female). Age was associated with higher HIT-6 scores in the myasthenia gravis and MS group. Females in the IIH group had higher HIT-6 scores compared to males.

Compared to the headache cohort, patients with MS (β = -6.81,95%CI [-11.09, -2.53],p=0.002), myasthenia gravis (Estimate=-13.13,95%CI[-22.20,-4.06],p=0.005), eye movement disorders (β = -7.55,95%CI [-13.50,-1.60], p=0.01) and ophthalmic conditions (β = -9.28, 95%CI [-14.08,-3.77], p<0.001) had significantly lower HIT-6 scores. Visual assessment and comorbidity were not associated with baseline HIT-6 values.

Significant differences in HIT-6 scores between diagnoses diminished by 9 months follow up.

Conclusion: Patients with MS, myasthenia gravis, eye movement disorders and ophthalmic conditions report significantly lower scores than those with primary headache disorders. Patients with headache report decreased HIT-6 scores over time. Patients likely experience an improvement in symptoms or effectively adapt to their conditions over time.

Monash School of Translational Medicine Prize for Neuroscience Research

The Impact of COVID-19 Infection on Multiple Sclerosis Disease Course Across 12 Countries: A Propensity-Score Matched Cohort Study

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Aim: To evaluate the effect of COVID-19 infection on MS disease course with a large propensity-matched cohort.

Methods: This multi-centre cohort study analysed relapse and disability outcomes post-COVID-19 infection after balancing covariates using a propensity score matching method. The study period was from the 11th of September 2019 to the 16th of February 2023. The mean follow-up period was 1.7 years. Data was retrieved from the MSBase Registry. Propensity scores were obtained based on age, sex, disease duration, baseline Expanded Disability Status Scale (EDSS), MS course, relapses pre-baseline, disease-modifying therapy (DMT) class and country. Primary outcomes were time to first relapse, annualised relapse rate (ARR) and time to confirm EDSS progression. Secondary outcomes were time to EDSS of 3, 4 or 6. Sensitivity analyses with baseline DMT classes were performed.

Results: The study included 2253 cases and 6441 controls. After matching, there were 2161 cases and an equal number of matched controls. Cases had a significantly higher ARR (ARR = 0.10 [95%CI 0.09–0.11]) compared to controls (ARR = 0.07 95%CI[0.06–0.08]). Cases had a significantly greater hazard of time to first relapse compared to controls (hazard ratio (HR) = 1.54 95%CI[1.29–1.84]). There was no association between COVID-19 infection and 24-week EDSS progression (HR = 1.18 95%CI[0.92–1.52]), or time to EDSS of 3, 4 or 6. For patients on interferons and glatiramer acetate (BRACE), COVID-19 infection was associated with a greater hazard of time to first relapse (HR = 1.8395%CI[1.25–2.68]) and greater hazard of time to EDSS of 3 (HR = 2.04 95%CI[1.06–3.90]) compared to patients on BRACE therapy without COVID-19 infection.

Conclusion: COVID-19 infection was associated with a significantly increased MS relapse rate and a shorter time to first relapse. There was no effect on confirmed EDSS progression over the short term. These results support ongoing COVID-19 risk minimisation strategies to protect patients with MS.

Monash School of Translational Medicine Prize for Neuroscience Research

Neuroprotection and Repair Following Daily Oral Administration of 3,5-Diiodothyropropionic Acid (DITPA) in Experimental Autoimmune Encephalomyelitis (EAE)

Emamnejad R, Theotokis P, Lee JY, Pagnin M, Nheu D, Ellen O, Ye S, Kim MJ, Ozturk E, Mahlis M, Saxena I, Rashidbenham Z, Lee NT, Wright DK, McDonald S, O'Brien W, McLean C, Bedolla DE, Birarda G, Wood B, Heraud P, Young KM, Jeppe KJ, Barlow CK, Carmichael I, Grigoriadis N, Petratos S

Multiple sclerosis (MS) involves oligodendrocyte degeneration and central nervous system (CNS) demyelination. Monocarboxylate transporter 8 (MCT8) facilitates thyroid hormone (TH) entry into the CNS to support oligodendrocyte maturation and myelination but may be impaired in demyelinating lesions. The TH analogue 3,5-diiodothyropropionic acid (DITPA) bypasses MCT8, promoting oligodendrocyte survival and remyelination, and is currently in clinical trials for Allan-Herndon-Dudley syndrome.

Aim: To trial the MCT8-independent TH analogue, DITPA, as a potential therapeutic in neuroinflammatory-mediated demyelination models and characterise CNS tissue preservation and repair mechanisms.

Methods: Metabolomic, proteomic, and histopathological analyses of human MS samples and EAE mouse model confirmed MCT8 deficiency and impaired AKT–mTOR–PANK2 signalling. We then conducted a preclinical trial in two EAE models: (1) Plp-CreERT2::ROSA26-stop-EYFP transgenic mice and (2) female C57BL/6J mice immunized with MOG_{35-55}. DITPA, other TH analogues, and vehicle controls (1.5 mg/kg daily) were administered at disease onset or peak to assess oligodendrocyte preservation and remyelination using clinical scoring, DigiGait, histopathology, MRI, TEM, metabolomics, proteomics, electrophysiology, and serum biomarkers.

Results: MCT8 and TH signalling were downregulated during neuroinflammation in human MS tissue and EAE mouse models, prompting DITPA evaluation. DITPA Treatment, limited neurological decline more effectively than other thyromimetics, as assessed by clinical scoring and DigiGait analysis. Treatment enhanced oligodendrocyte survival in the lumbosacral spinal cord, reduced myelin and axonal damage, and lowered serum neurofilament light chain levels and neurotoxic kynurenine pathway. Mechanistically, DITPA activated AKT–mTOR–PANK2 signalling in mouse spinal cords, stimulating CoA and lipid biosynthesis. Ultrastructural analysis of optic nerves demonstrated improved myelinated fibre integrity and remyelination, while MRI confirmed preservation of spinal cord white matter. DITPA caused no adverse effects, with normal liver, thyroid, and gastrointestinal function.

Conclusion: DITPA promotes oligodendrocyte survival and remyelination, effectively protecting the CNS from neuroinflammatory injury and representing a promising therapeutic candidate for MS.

Monash School of Translational Medicine Prize for Neuroscience Research

Neurological Impairment Following Resuscitation from Cardiac Arrest Is Associated with a Delayed Neuroinflammatory Response in Mice

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Cardiac arrest (CA) and resuscitation results in global ischemia-reperfusion injury, particularly to the hypoxia-sensitive brain. Mechanistic drivers of progressive damage remain uncharacterised, especially immunological contributors.

Aim: To investigate neuroinflammatory and immunological changes associated with neurological impairment following resuscitation from CA.

Methods: A total of 123 adult C57BL6/J mice (46% female) aged 8-12 weeks were randomised to receive a bolus of intravenous KCl (40µl, 0.5M) to induce asystole (CA) or an infusion over 60s (unarrested controls). After 8min CA, hemodynamically validated chest compressions (300BPM) were provided for up to 10min, with intravenous adrenaline support (4µg, both groups). Successfully resuscitated animals were recovered to 24h and 96h endpoints, and underwent multimodal neurological assessments, blood counts and plasma biomarker multiplexing. Immunohistochemistry for GFAP and Iba1 was performed to assess neuroinflammation. Additionally, brain magnetic resonance (9.4T) diffusion tensor imaging (MR-DTI) was performed 72h to assess neuronal integrity.

Results: CA animals exhibited prominent behavioural aberrations and neuromuscular deficits at 24h post-resuscitation. Systemic immune responses in CA animals were characterised by a dysregulation of circulating cytokines, a proinflammatory myeloid response, and lymphocytopenia (3.64±0.27 vs 10.01±0.48 10^9/L at baseline, $p<0.001$), which interestingly correlated with poorer neuromuscular function ($r=0.48$, $p<0.001$). At 96h post-resuscitation, we observed delayed reactive microgliosis in hippocampal dentate gyrus (105.40±6.90 vs 56.36±6.77 cells/mm^2 in controls, $p=0.001$) and CA1 regions ($p=0.016$) that was not present at 24h. CA brains also expressed robust GFAP signals indicative of widespread astrocytosis. DTI measures of axonal integrity revealed marked white matter microstructural changes, and significant cerebrovascular congestion was visualised on angiography of CA brains compared to unarrested controls.

Conclusion: These findings show that acute neurological deficits post-CA are accompanied by a network of neuroinflammatory and immunopathological processes. These findings build upon a translational platform for advancing immune-associated biomarker prognostication and immunomodulatory therapeutics to improve post-resuscitation neurological outcomes for CA patients.

Monash School of Translational Medicine Prize for Neuroscience Research

Preclinical Modelling of Upper Limb Motor Recovery After Stroke

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Many stroke survivors are left with permanent upper limb motor disability. To effectively test new motor recovery interventions, our team is developing a preclinical platform that models clinically relevant upper limb rehabilitation and deficits poststroke.

Aim: To establish a clinically relevant preclinical model of stroke rehabilitation by testing the effect of task-specific forelimb training on motor function.

Methods: C57BL/6J mice were allocated to sham (n=10), stroke + no rehabilitation (n=10), or stroke + rehabilitation (n=10) groups. All mice underwent 15 days of training on the Pasta Matrix Reaching Task (PMRT) prior to stroke induction. Photothrombotic (PT) stroke was induced by intraperitoneal Rose Bengal injection followed by cold-light illumination of the motor cortex. Four days post-stroke, rehabilitation mice commenced a 10-day daily PMRT program; sham and stroke + no rehab mice did not receive training. Motor outcomes were assessed using the horizontal grid test (forelimb coordination measured at footslips) at 7 and 15 days after stroke. Data were analysed using one-way ANOVA with Tukey's post-hoc comparisons.

Results: PT stroke induced significant motor impairments. At 7 days after stroke, foot-slips per metre increased compared with sham (7.12 ± 2.57): stroke + no rehab (13.63 ± 2.57, p=0.0447 vs sham) and stroke + rehab (12.19 ± 2.57, p=0.1384 vs sham). By 15 days, impairments were more pronounced, with sham (8.19 ± 2.69), stroke + no rehab (18.79 ± 2.69, p=0.0014 vs sham), and stroke + rehab (14.57 ± 2.69, p=0.0624 vs sham). Rehabilitation may attenuate deficits relative to stroke + no rehab, though variability remained and differences were not statistically significant.

Conclusion: This work establishes a rehabilitation-focused PT stroke model that produces reproducible upper limb impairments and enables evaluation of recovery with and without training. It provides a platform for studying rehabilitation processes and for testing future interventions in a clinically relevant context.

Monash School of Translational Medicine Prize for Neuroscience Research

Using Interpretable Machine Learning on Routine Cognitive Tests Scores Accurately Predicts Degenerative and Amnestic Cognitive Presentations

Christensen M, Shen Y, Jiang Y, Darby D, Ge Z, Brodtmann A

Dementia is now the leading cause of death in Australia, yet diagnostic delay exceeds three years, preventing timely access to emerging disease-modifying treatments.

Aim: We hypothesised that machine learning (ML) models using routine cognitive test scores could (i) distinguish degenerative from non-degenerative causes of cognitive symptoms, (ii) discriminate amnestic presentations from normal cognition, and (iii) stage as mild cognitive impairment (MCI) versus dementia, each achieving an AUC > 0.90.

Methods: We reviewed 630 consecutive patient records from one cognitive service (2012-2024). 582 patients (56% male, mean onset age 64.7) met inclusion criteria with completed cognitive screen (Adenbrooke's Cognitive Examination-Revised, ACE-R) and diagnosis of a degenerative condition across twelve phenotypes (384 patients, 66%) or normal cognition (198 patients). The degenerative cohort were mostly at MCI stage (64%) and a subset were amnestic (218). Input features comprised ACE-R item scores (52 features +/- 5 sub-scores), and/or its Mini-Mental State Examination (MMSE) subset (12 features +/- total). Random Forest (RF) and XGBoost models were trained on an 80/20 split. Primary metrics were AUROC and AUPRC; SHAP supported interpretability.

Results: Models showed strong degenerative/non-degenerative differentiation (RF, ACE-R, AUC=0.903, AUPRC-degenerative=0.912, AUPRC-non-degenerative=0.865), with categorical fluency and delayed recall the strongest predictors. Amnestic versus non-amnestic discrimination was excellent (RF, ACE-R +subscores, AUC=0.977, AUPRC-amnestic=0.977, AUPRC-non-amnestic=0.955), with the memory subscore most influential. Staging performance was modest (XGBoost, MMSE +total, AUC=0.703, AUPRC-MCI=0.834, AUPRC-dementia=0.596), with total MMSE score the primary differentiator.

Conclusion: Two of our three hypotheses were supported. ML models using routine cognitive tests accurately identify degenerative and amnestic cognitive presentations. High amnestic detection aligns with the memory emphasis of our cognitive screen, whereas modest staging reflects absent functional data. Future work will incorporate qualitative data in a multi-modal model to improve staging and move beyond binary classification to help non-specialists confidently distinguish dementia subtypes, reducing diagnostic delay for patients.

Monash School of Translational Medicine Prize for Neuroscience Research

Data-Driven Latent Construct Composites of Brain Health are Associated with Cognition and Alzheimer's Disease Dementia

Rowsthorn E, Xia Y, Breakspear M, Fripp J, Robinson GA, Lupton MK, Law M, Pase MP, Harding IH

Individual biomarkers provide limited insights into the overall integrity of complex brain systems (e.g., vascular function). Multimodal composite biomarkers have potential to more wholistically characterize brain health in aging and disease.

Aim: To validate previously defined composite biomarkers (latent constructs)[1], and test their associations with cognition and mild cognitive impairment (MCI) or Alzheimer's disease dementia (AD) in an independent cohort.

Methods: We studied 222 PISA[2] participants (mean age 63, 73% women): 180 healthy controls (HC), 19 MCI and 23 AD. Biomarkers included brain MRI metrics, cardiovascular indices and plasma protein markers[1]. In HC's, confirmatory factor analysis (CFA) was used to define latent factors. Group differences in factor composite scores were tested with ANCOVA, and associations with cognition (Similarities, RAVLT-A, Topographical Test, FAS) with linear regression. Logistic regression tested associations of individual measures and composites with MCI/AD diagnosis. Models adjusted for age, sex, intracranial volume and education.

Results: CFA confirmed three factors: Brain & Vascular Health (hippocampal volume, ventricle volume, CBF); WM Fluid Dysregulation (Free Water, WM ePVS); Blood Biomarkers (GFAP, NfL, pTau181). Compared to HCs, MCI and AD participants had lower Brain & Vascular Health ($F_{(df=213)}$=113.39, p<.001) and greater Blood Biomarkers ($F_{(df=213)}$=94.30, p<.001), but no difference in WM Fluid Dysregulation ($F_{(df=213)}$=0.69, p=.504). Brain & Vascular Health related positively, and Blood Biomarkers negatively, to all cognitive tests (all p>.004). Brain & Vascular Health showed the strongest association with MCI/AD (OR=0.07, 95%CI=0.03–0.15), exceeding PET Amyloid Centiloid (OR=9.94, 95%CI=5.27–22.84).

Conclusion: Biologically meaningful factors were confirmed. Brain & Vascular Health was most strongly associated with MCI/AD. System-level biomarker frameworks may improve early detection and risk stratification in aging and dementia.

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Monash School of Translational Medicine Prize for Neuroscience Research

Whole Genome Sequencing in Drug-Resistant Epilepsy: Diagnostic Efficiency and Cohort Findings from a Randomised Controlled Trial

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Whole genome sequencing (WGS) offers the potential to improve diagnosis in epilepsy, including in drug-resistant cases with suspected genetic aetiology. However, its clinical utility, cost-effectiveness, and broader impact remain to be evaluated, particularly in the adult population.

Aim: To compare six-month diagnostic efficiency between immediate and delayed WGS and to report whole-cohort diagnostic yield.

Methods: This multicentre randomised trial enrolled participants aged 1 month to 65 years with epilepsy onset ≤18 years and drug-resistant epilepsy of suspected genetic cause. Participants were allocated to immediate or delayed group by 12 months and were followed for 2 years after randomisation.

Results: Eighty-nine participants were enrolled (46 female, 51.7%; mean age 28.9 years); 21 were children (23.6%) and 44 (49.4%) had intellectual disability. Clinical syndromes included developmental epileptic encephalopathy (DEE; 32.5%), malformations of cortical development (MCD; 34.9%), non-lesional focal epilepsy (nIFE; 15.7%), mesial temporal sclerosis (MTS; 8.4%), and other (8.4%). At six months, 12 of 46 patients (26.1%) in the immediate group had a genetic diagnosis versus 0 of 43 in the delayed group (p=0.00023). Overall (interim), 22 of 88 patients (25.0%) had a genetic diagnosis, comprising 9 pathogenic and 13 likely pathogenic variants, including single-nucleotide variants, insertions/deletions, and copy-number variants. At end of follow-up, yield was higher in children (38.1% vs 20.6%) and in those with intellectual disability (31.8% vs 17.8%), but neither difference was significant (p=0.15). The age-adjusted arm comparison showed no difference (Mantel–Haenszel OR 1.04, 95% CI 0.40–2.72; p=0.94). The highest yields were observed in DEE (34.5%) and MCD (24.1%), followed by nIFE (18.8%), and none in MTS or other categories.

Conclusion: Immediate WGS enables earlier diagnosis at six months. The whole-cohort diagnostic yield is 25%, with higher returns in children, DEE, and MCD, and a meaningful yield in adults. Clinical and economic outcomes are under analysed.

Monash School of Translational Medicine Prize for Neuroscience Research

Biomarkers of neuroaxonal and astrocytic pathology in autoimmune encephalitis

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Background: Autoimmune encephalitis (AE) is an immune mediated central nervous system disorder that can cause significant disability including cognitive dysfunction. Elevations in neurofilament light (NfL) and glial fibrillary acidic protein (GFAP) have been demonstrated in AE. Their relationship to disease phase and outcomes is not well established.

Methods: Patients with acute (n=15) and chronic (>3 months post treatment, n=51) AE underwent serum NfL and GFAP analysis and were compared to a control cohort (n=28) using linear mixed modelling. Participants with chronic AE were stratified by level of cognitive dysfunction. Correlations between NfL or GFAP and cognitive dysfunction, modified Rankin Scale [mRS] or Clinical Assessment Scale in Autoimmune Encephalitis [CASE] scores were analysed with regression modelling.

Results: The acute AE cohort had higher NfL (Z score: 2.18 [1.39, 2.98]) and GFAP (212.35 [148.09, 304.50]) compared with the chronic (0.88 [0.46, 1.29], p<0.01; 118.97 [100.88, 140.30], p=0.02) and control cohorts (0.66 [0.12, 1.21], p<0.001; 111.35 [82.81, 149.75], p=0.03). Poorer discharge mRS correlated with elevated NfL (OR 3.77 [1.21, 11.70]) and GFAP (OR 47.92 [2.35, 978.68]). Higher GFAP was associated with moderate-severe cognitive dysfunction (150.61 [115.94, 195.64] vs 108.43 [90.68, 129.65]), p=0.04) and correlated with poorer follow-up mRS (OR 2.28 [1.27, 4.10]) and CASE (ß = 1.04 [0.34, 1.73]), scores.

Conclusions: Acute AE demonstrates elevated markers of neuronal and astrocytic pathology. Low levels of NfL in chronic AE, regardless of current function, suggest that ongoing neuroaxonal injury is unlikely. Elevated GFAP in AE patients is correlated with ongoing sequalae.

Monash School of Translational Medicine Prize for Neuroscience Research

Does Epilepsy Increase Vulnerability to Develop Alcohol Use Disorder? A Study in the Kainic Acid Model of Temporal Lobe Epilepsy

Sami A, O'Brien TJ, Casillas-Espinosa P, Jupp B

Despite the high comorbidity of epilepsy and alcohol use disorder (AUD), their aetiological relationship remains poorly understood. The co-existence of AUD and epilepsy may potentially reflect neuropsychiatric risk factors shared between these disorders, for example, the anxiety and depression associated with temporal lobe epilepsy (TLE). Using the kainic acid-induced status epilepticus (KASE) rat model of TLE, we aimed to examine whether epilepsy enhances AUD-like behaviours and establish their relationship to the expression of anxiety and depression-like behaviour as potential contributory factors. Adult male Wistar rats underwent KASE (n=14) or sham treatment (n=10) and were assessed eight weeks later for the development of epilepsy. Anxiety and depression-like behaviours were evaluated before chronic intermittent ethanol access over 12 weeks. The following AUD-like behaviours were assessed: escalation of intake during intermittent access, intake of quinine-adulterated ethanol (punishment-resistance), and intake following abstinence (relapse-like behaviour). KASE rats exhibited decreased escalation and punishment resistance compared to controls; however, they exhibited a significant increase in relapse-like behaviour. The proportion of rats rated high for AUD-like behaviour (top 25% of the population in at least 2/3 of the behaviours assessed) did not differ between epileptic and non-epileptic rats. While a significant relationship was observed between punishment resistance and anxiety-like behaviour in the control group, this did not extend to epileptic rats. Our findings suggest that the observed comorbidity between AUD and epilepsy may reflect a vulnerability within seizure syndromes distinct from TLE or, alternatively, that individuals with AUD may be at increased risk for developing epilepsy.

Keywords: Epilepsy, Alcohol Use Disorder, Neuropsychiatric Comorbidities, Temporal Lobe Epilepsy, Kainic Acid-Induced Status Epilepticus.

Monash School of Translational Medicine Prize for Neuroscience Research

Geomagnetic Disturbance and Ultraviolet Exposures Influence Multiple Sclerosis Onset Timing

Seyed Aidin Sajedi, Chao Zhu, Fahimeh Abdollahi, Fatemeh Saberi, Dana Horakova, Serkan Ozakbas, Magd Zakaria, Vahid Shaygannejad, Masoud Etemadifar, Samia J. Khoury, Bianca Weinstock-Guttman, Francesco Patti, Cavit Boz, Sara Eichau, Valentina Tomassini, Murat Terzi, Pierre Duquette, Allan G Kermode, Guntis Karelis, Maria Pia Amato, Jana Libertinova, Francois Grand'Maison, Nevin Shalaby, Tomas Kalincik, Katherine Buzzard, Mario Habek, Yolanda Blanco, Pierre Grammond, Jeannette Lechner-Scott, Jose E Meca-Lallana, Ayse Altintas, Pavel Hradilek, Koen de Gans, Recai Turkoglu, Zuzana Rous, Davide Maimone, Marek Paterka, Michael Barnett, Julie Prevost, Aysun Soysal, Emanuele D'Amico, Matteo Foschi, Riadh Gouider, Radek Ampapa, Stella Hughes, Nevin John, Vincent van Pesch, Cristina Ramo-Tello, Miroslav Mares, Carmen-Adella Sirbu, Zbysek Pavelek, Miguel D'Haeseleer, Celia Oreja-Guevara, Chris McGuigan, Maria Di Gregorio, Elisabetta Cartechini, Jens Kuhle, Daniele Spitaleri, Mehmet Fatih Yetkin, Bhim Singhal, Suzanne Hodgkinson, Claudio Solaro, Edgardo Cristiano, Mark Slee, Guy Laureys, Chokri Mhiri, Pamela McCombe, Bruce Taylor, Eva Recmanova, Emmanuelle Lapointe, Thor Petersen, Talal Al-Harbi, Richard Macdonell, Bart Wijmeersch, Canan Yucesan, Dheeraj Khurana, Jabir Alkhaboori, Jose Luis Sanchez-Menoyo, Jiwon Oh, Orla Gray, Deborah Mason, Katrin Gross-Paju, Farouk Talaat, Melissa Cambron, Justin Garber, Abdorreza Naser Moghadasi, Seyed Mohammad Baghbanian, Nikolaos Grigoriadis, Eduardo Aguera-Morales, Waldemar Brola, Jihad Inshasi, Tamara Castillo-Triviño, Ivana Stetkarova, Jana Houskova, Juan Ignacio Rojas, Mona AlKhawajah, Nevin Shalaby, Bassem Yamout, Simón Cárdenas-Robledo, Todd A. Hardy, Jose Antonio Cabrera-Gomez, Pavel Stourac, Dieter Poehlau, Ilya Kister, Oliver Gerlach, Cameron Shaw, Norma Deri, Patrice Lalive, Rana Karabudak, Neil Shuey, Barbara Willekens, Walter Oleschko Arruda, Tunde Csepany, Angel Perez Sempere, Enrique Gomez-Figueroa, John Tzartos, Deborah Field, Joyce Pauline Joseph, Claudio Gobbi, Gregor Brecl Jakob, Nai-Wen Tsai, Fraser Moore, Ismail Ramadan, Danny Decoo, Maria Cecilia Aragon de Vecino, Jennifer Massey, Masayuki Mizuno, Irene Treviño-Frenk, Csilla Rozsa, Marija Cauchi, Norio Chihara, Donald McCarren, Abdullah Al-Asmi, Chiyoko Nohara, Magdolna Simo, Raed Alroughani, Jose Andres Dominguez, Karim Kotkata, Jyh Yung Hor, Elizabeth Alejandra Bacile, Vetere Santiago, Claudia Vasconcelos, Krisztina Kovacs, Mike Boggild, Eli Skromne, Yuri Nakamura, Amit Bar-Or, Anneke van der Walt, Helmut Butzkueven

The age at onset (AAO) of multiple sclerosis (MS) may be influenced by solar-related environmental factors, such as geomagnetic disturbances (GMD) and ultraviolet radiation (UVR). The life stages during which these exposures may affect AAO remain unclear.

Objectives: To investigate the potential associations between GMD and UVR exposures at key life stages and the AAO of MS, using a large global registry.

Methods: Data from 75,359 individuals with MS were collected from the MSBase registry. GMD data were obtained from NASA and the German Research Centre for Geosciences; UVR data came from the TEMIS database. Exposures were evaluated during fetal life, early childhood (≤10 years), and the 12 months preceding the symptom onset (symptom-onset year). Associations with AAO were analysed using partial correlations, group comparisons, and random forest regression (RFR).

Results: GMD exposure during the symptom-onset year showed a moderate inverse correlation with AAO, indicating earlier disease onset with higher GMD. UVR in the same period showed a very weak positive correlation. Group comparisons revealed a lower AAO with higher GMD exposure. RFR identified symptom-onset year GMD exposure as the strongest predictor of AAO, followed by symptom-onset year UVR exposure. Early-life exposures showed no meaningful associations.

Conclusion: Higher GMD exposure in the symptom-onset year is associated with an earlier MS onset. UVR exposure also influences AAO but to a lesser extent. GMD may be a potential environmental risk factor for earlier MS onset, highlighting the need for further mechanistic research.

Keywords: Geomagnetic disturbance, ultraviolet radiation, MS

Monash Partners Comprehensive Cancer Consortium (MPCCC) Prize for Best Abstract in Cancer Research

CLOX and NEUROTOX: Utility of the Clock Drawing Task in Monitoring for Immune Effector Cell-Associated Neurotoxicity Syndrome Following Chimeric Antigen Receptor T-Cell Therapy

Christina Kazzi, Ty Simpson, Miriam Wronski, Nabil Seery, Robb Wesselingh, Tracie H Tan, Katherine Y Ko, Daniel J Pearce, Cassandra Abbott, Jian Li, Sarah P Griffith, Shu Min Wong, Michael Westworth, Shafqat Inam, Constantine S Tam, Shaun Fleming, Anneke Van Der Walt, Terence J O'Brien, Rubina Alpitsis, Andrew Spencer, Charles B Malpas, Paul Sanfilippo, Mastura Monif

Aim: Immune effector cell-associated neurotoxicity syndrome (ICANS)-associated cognitive impairment is common in patients who receive chimeric antigen receptor T-cell (CAR-T) therapy. There is a need for tools to efficiently diagnose and monitor ICANS. Recent research has identified that the current gold standard, the ICE score, overlooks mild neurocognitive change, so ICANS diagnosis may be delayed if the ICE score is used in isolation. This study evaluated the utility of the Clock Drawing Task (CDT) in detecting ICANS in patients with haematological cancers following CAR-T therapy.

Methods: Data were collected from CAR-T patients at The Alfred Hospital, Melbourne, Australia. Patients underwent frequent assessments using the immune effector cell-associated encephalopathy (ICE) score and the CDT, scored using a modified CLOX (CLOX-M) rating scale, during their admission. We retrospectively reviewed the medical records of consecutive patients who received CAR-T therapy between September 2022 and February 2024 to assess for ICANS and changes in ICE score and CLOX-M.

Results: 1212 clock drawings were time-matched within an hour of an ICE score for 54 patients (39% female, 63.85 ± 13.26 years). Fourteen (26%) patients developed ICANS. Change in CLOX-M scores from baseline and ICE scores were significantly correlated (rho=0.34, $p<0.001$). Receiver Operating Characteristic (ROC) analysis demonstrated that the CLOX-M score has moderate discriminatory power (AUC=.737). A decrease in CLOX-M score of 2 or more had high specificity (0.994) but low sensitivity (0.263) for detecting ICANS.

Conclusion: The CDT can be used to complement the ICE score to improve ICANS monitoring. As the indications for CAR-T therapy increase, cost-effective and practical methods of monitoring for adverse effects—such as the CDT— are critical to improve recognition, diagnosis and management of ICANS. Ultimately, this can improve patient outcomes.

Monash Partners Comprehensive Cancer Consortium (MPCCC) Prize for Best Abstract in Cancer Research

Surveillance of Left Ventricular Function Among Asymptomatic Cancer Survivors

Cheng Hwee Soh, Thomas H Marwick

Background: Cancer survivors face an elevated risk of heart failure due to shared risk factors and cardiotoxic cancer treatments. While current guidelines recommend cardiac surveillance in this population, the optimal timing and intensity of monitoring remain poorly defined. Furthermore, the prevalence of subclinical cardiac dysfunction in asymptomatic cancer survivors are not well characterized.

Aim: To investigate the association between cancer history and cardiac function in asymptomatic individuals.

Method: This study included participants with documented cancer history and matched with non-cancer controls based on age, sex, diabetes and blood pressure. Cardiac function, primarily left ventricular ejection fraction (LVEF), was assessed using cardiac magnetic resonance (CMR).

Results: Of 23,854 cancer survivors (age 61.0±6.8 years, 60.9% female) and matched controls, 1,051 survivors and 1,538 controls underwent CMR (Figure 1). Survivors from breast or haematological malignancies demonstrated minor differences in LVEF (59.5±6.4 vs 60.1±6.4, p<0.001) and global circumferential strain (-22.4±3.5 vs -22.6±3.5, p<0.001) compared to controls. Analysis stratified by time since cancer diagnosis revealed that both LVEF (p=0.014) and global circumferential strain (p=0.045) were less likely to be impaired with increasing time from diagnosis. More participants with cancer history (OR=1.29 [1.09-1.53], p=0.004), particularly breast cancer (OR=1.49 [1.22-1.81], p<0.001), were associated with low LVEF (<=55%) after adjusting for age, sex, years since cancer diagnoses and blood pressure medication.

Conclusion: This study identifies a critical window for cardiac surveillance in cancer survivors, with the highest risk of subclinical dysfunction occurring in the early post-treatment period. The findings support implementing targeted cardiac monitoring strategies, particularly for breast cancer survivors, with potential for reducing monitoring intensity over time in those without early dysfunction. These results can inform the development of more cost-effective, risk-stratified cardiac surveillance protocols in cancer survivorship care, potentially enabling earlier intervention in high-risk periods while avoiding unnecessary testing in long-term survivors with stable cardiac function.

Monash Partners Comprehensive Cancer Consortium (MPCCC) Prize for Best Abstract in Cancer Research

Retrospective Review of Peg-Asparaginase Dosing and Related Adverse Events in Adults with Acute Lymphoblastic Leukaemia

Khuu M, Bortz H, Curtis D, Fleming S, Patil S, Poole S, Jokanovic N, Coutsouvelis J

Protocols to treat Philadelphia chromosome negative acute lymphoblastic leukaemia (Ph- ALL) often include pegylated E coli asparaginase (pegA). There is a lack of consensus on the optimal dose and frequency for pegA in adults. PegA-associated Grade ≥3 adverse effects (AEs) reported in an initial trial using six doses at 2000 IU/m2, reported hepatotoxicity (62.7%), thrombosis (15.7%), pancreatitis (13.7%), hypersensitivity (5.9%) and haemorrhage (2.0%).

Aim: To determine the incidence of pegA-associated AEs in adults with Ph- ALL treated with local pegA-containing protocols.

Methods: Retrospective cohort study of patients with Ph- ALL commenced on pegA-containing protocols (FRALLE-93 and FRALLE-2000) between January 2016-June 2023 at a major metropolitan health service was conducted. Medical records, pathology and dispensing data were reviewed to confirm doses and identify AEs up to 12-months post-dose. AEs were graded on Common Terminology Criteria for Adverse Events v5.

Results: Twenty-four patients were included (median age 25 years;IQR 21,37)). Nine patients (37.5%) completed their protocol at full intensity (2500 IU/m2 for 3-4 doses), and three patients (12.5%) completed their protocol with pegA dose adjustments for AEs or risk factors including obesity (mean1375 IU/m2 for 4 doses). Twelve (50.0%) patients did not complete the protocol (mean 2033 IU/m2 for 2-3 doses). Reasons for cessation included AEs, death, relapsed/refractory disease, and loss to follow up. Nineteen patients (79.0%) experienced a pegA-associated AE. Grade ≥3 AEs included hepatotoxicity (n=13, 54.2%), hypersensitivity (n=3, 12.5%), thrombotic event (n=3, 12.5%), and one (4.2%) with pancreatitis (n=1, 4.2%). No patients experienced a pegA-associated bleed or death.

Conclusion: In this single-center cohort, PegA dosed at 2500IU/m2 in the FRALLE protocol had an incidence of AEs that was expected based on initial clinical trial outcomes. In response to risk factors and AEs, pegA doses were modified in practice to facilitate completion of the FRALLE protocol and minimize further toxicities.

Monash Alfred Psychiatry Research Centre (MAPrc) Prize for Psychiatry Research

Sex-Specific Grey Matter Abnormalities Prior To Onset of Non-Suicidal Self-Injury in Youths

Jenkins, L. M. Kouchakidivkolaei, M., Popuri, K., Washburn, J., Westlund Schreiner, M. Chen, L., Manuele, S. J., Shankman, S., Garavan, H., Cullen, K., and Wang, L.

Non-suicidal self-injury (NSSI), the deliberate destruction of one's own body tissue without suicidal intent, is associated with negative outcomes including suicide. Males and females differ in the prevalence, characteristics (e.g. methods), and cognitive and psychological correlates of NSSI, suggesting that biological risk factors for NSSI may differ between males and females. However, no MRI study of NSSI has examined males distinct from females.

Aim: To characterise sex-specific grey matter precursors of NSSI.

Methods: We leveraged data from the Adolescent Brain Cognitive Development[SM] study to identify youths who engaged in NSSI for the first time between baseline (mean age=10 years) and two-year follow-up (premorbid NSSI; pNSSI). We compared subcortical morphometry between pNSSI and demographically and clinically matched controls separately for males (n=204) and females (n=344) as well as cortical thickness in a smaller subset.

Results: In females, compared to controls the pNSSI group had inward surface morphometry of the striatum and thalamus, and reduced cortical thickness in the anterior cingulate and ventromedial prefrontal cortex, with some increased cortical thickness in early sensory regions. Males showed increased cortical thickness in the pNSSI group compared to controls in sensory, motor and default mode network regions. Both males and females with pNSSI showed greater cortical thickness in the right entorhinal cortex.

Conclusion: This is the first study to show that males and females have different neurobiological abnormalities that predate NSSI. Our results support the theory that individuals at risk for NSSI have a hypersensitized perception-action system, with alterations in early sensory and sensory integration regions, combined with reduced influence of top-down regulatory regions of the ventromedial prefrontal cortex and ACC, in addition to reward-related abnormalities, as manifested in striatal and OFC changes. Our results are consistent with the neural diathesis theory which suggests that neural alterations may confer increased NSSI risk.

Monash Alfred Psychiatry Research Centre (MAPrc) Prize for Psychiatry Research

The Impact of Centralised Versus Decentralised Ward Designs on Fall Incidences in an Older Adult Mental Health Inpatient Unit

Shalitha Kanishka Bandara Seneviratne (Registered Psychiatric Nurse)

Older adults in mental health inpatient units face an increased risk of falls, which can lead to longer hospital stays, worsened health outcomes, and higher healthcare costs. Ward design has the potential to impact fall incidences by influencing staff visibility, response times, and environmental factors such as layout and space.

Aim: To evaluate the impact of centralised versus decentralised ward designs on fall incidences in an older adult mental health inpatient unit.

Methods: Retrospective data on fall incidents will be collected from an incident reporting system (RISKMAN) for a six-month period before and after the relocation of a ward from a centralised to a decentralised layout in one acute mental health unit in Victoria, Australia (at the Alfred). The primary variables include witnessed vs. unwitnessed falls, fall time, location, patient risk factors (e.g., age, mental status, fall risk assessment), and severity. Qualitative data will be collected through semi-structured interviews with nursing staff who worked in both ward designs until data sufficiency is achieved. Data will be analysed using descriptive statistics for quantitative data and thematic analysis for qualitative data.

Results: It is anticipated that the analysis will reveal differences in fall rates between the two ward designs, particularly in terms of witnessed versus unwitnessed falls. Nurses' perceptions of the changes in ward layout and their influence on fall prevention practices will also be explored.

Conclusion: This research will provide valuable insights into how ward design influences fall incidences in older adult mental health inpatient settings. It is expected that decentralised designs may offer better visibility and accessibility for staff, potentially leading to reduced fall rates. The study will inform future ward design policies and patient safety protocols, especially in the context of mental health inpatient care for older adults. Pending ethics approval – December 2025, completed as part of master's thesis.

Monash Alfred Psychiatry Research Centre (MAPrc) Prize for Psychiatry Research

Exploring Student Nurses' Experiences During Mental Health Placements: A Thematic Analysis of Student Feedback

Harmanbeer Singh (Nursing Educator - Clinical Grad/Undergrad)
Shalitha Kanishka Bandara Seneviratne (Registered Psychiatric Nurse)

Background: Mental health nursing placements are critical in shaping student nurses' clinical skills and perceptions of mental health care. These placements often influence students' career decisions and perceptions of the mental health field. Understanding the challenges and positives experienced by students can help enhance placement structures and support systems. This research explores the feedback of student nurses during their mental health placements from 2022-2025.

Aim: To explore the experiences of student nurses during their mental health placements, focusing on the factors that influence their learning experiences, challenges faced, and career decisions regarding mental health nursing.

Methods: A qualitative thematic analysis will be conducted using feedback from redcap surveys completed by student nurses who participated in mental health placements between 2022 and 2025. Demographic information (e.g., age, sex, university level, prior mental health experience) will be gathered alongside qualitative responses related to orientation (e.g., anxiety levels, helpfulness of orientation, buddy nurses), clinical settings (e.g., inpatient wards, community teams, aged psychiatric units), bullying, staff attitudes, and educator accessibility. Open-ended responses will provide deeper insights into students' perceptions of the placement experience. Data will be analyzed using Braun & Clarke's thematic analysis framework.

Ethics: This study is pending ethics approval and will be conducted in accordance with institutional ethical guidelines.

Results: The findings will provide key insights into student nurses' experiences, highlighting the impact of orientation programs, peer support, clinical settings, and staff attitudes. These results will guide improvements in student support and placement preparation.

Conclusion: This research will inform strategies for improving mental health placements, providing valuable recommendations for nurse educators, preceptors, and staff to enhance student learning and support.

Monash Alfred Psychiatry Research Centre (MAPrc) Prize for Psychiatry Research

Bazedoxifene Plus Conjugated Estrogen to Treat Menopausal Depression – A Pilot Study

Kulkarni J, Mu E, Li Q, Malicka M, Gavrilidis E, de Castella A, Gurvich C

Background: Hormonal fluctuations during the menopausal transition, particularly declining brain estrogen levels, are strongly implicated in the onset of menopausal depression. While menopause hormone therapy (MHT) effectively alleviates physical symptoms, its use for mood disturbances remains limited. This is due to a lack of large-scale clinical trial evidence directly comparing MHT with antidepressants, as well as concerns regarding the long-term safety of estrogen and progestins. Newer alternatives, such as bazedoxifene—a selective estrogen receptor modulator—combined with conjugated estrogens, are considered safe and effective for managing physical menopausal symptoms.

Aim: This pilot trial aimed to evaluate the efficacy of bazedoxifene plus conjugated estrogens in improving depressive symptoms and quality of life in women with menopausal depression compared with placebo.

Methods: We conducted a 12-week, double-blind, randomised, placebo-controlled pilot trial to evaluate the effects of bazedoxifene plus conjugated estrogens on menopausal depression in 37 women. Twenty participants received active treatment and 17 received placebo. The primary outcome was the Montgomery–Åsberg Depression Rating Scale (MADRS). Secondary outcomes included the Menopause Depression Rating Scale (Meno-D) and the Menopause-Specific Quality of Life scale (MENQOL).

Results: Both groups showed reductions in MADRS scores from baseline to week 12, but the difference between groups was not statistically significant. However, women receiving bazedoxifene plus conjugated estrogens demonstrated significantly greater improvement on the Meno-D compared to placebo. Quality of life, as measured by MENQOL, also improved significantly in the treatment group.

Conclusion: Bazedoxifene plus conjugated estrogens improved symptoms of menopausal depression and quality of life, suggesting that combined hormone therapy may specifically target the unique symptom profile of menopausal depression. Further research is warranted to establish tailored treatments for this distinct subtype of depression, which appears responsive to hormone-based therapy.

Monash Alfred Psychiatry Research Centre (MAPrc) Prize for Psychiatry Research

An Innovative Approach to Support Eating Disorder Care within a Tertiary Hospital

M. Dumaresq, S. Collins, I. Duncan, L. Javen

Background: The setting of a metropolitan tertiary hospital without dedicated ED inpatient service has seen surging admissions from 40 in 2019 to 136 in 2024.

Aim: To address this problem an innovative workforce model was implemented in 2023 to improve multi-disciplinary team (MDT) collaboration and discharge processes. The model employed a Credentialed ED Dietitian and specialist ED nurse practitioner (NP) within the Consultation Liaison (CL) Psychiatry team. Dietitian roles included assessment and intervention, meal plans, guiding enteral feeding and renourishment process. NP role's involved biopsychosocial assessment, diagnosis and treatment recommendations and support to ward staff. Combined responsibilities included delivery of in-servicing and training to the MDT, and guideline development and dissemination.

Methods: Prospective data collection and comparison to retrospective data from 2019 was utilised to evaluate outcomes. MDT meeting occurrence was used as a marker of collaboration, and discharge follow-up criteria was coded as adequate if outpatient dietetic, medical and psychology follow-up was arranged.

Results: In 2019, the average occurrence of an MDT meeting was 15% of admissions, whereas in 2024 there was an average of 40%. Discharge criteria were met in 30% of admissions for 2019 and improved to 75% in 2024.

Conclusion: This innovative approach was able to improve MDT collaboration and adequate discharge planning, which is likely to improve transition of care into the community. Further investigation into clinical outcomes, as well as key stakeholder satisfaction are important to be undertaken in the future.

Monash Alfred Psychiatry Research Centre (MAPrc) Prize for Psychiatry Research

Australian Adults with Migraine Commonly Have Clinically Significant Levels of Previous Childhood Trauma

Dr Lakshini Gunasekera, Dr Shobi Sivathamboo, Dr Eveline Mu, Prof Terence O'Brien, Prof Helmut Butzkueven, Dr Elspeth Hutton and Professor Jayashri Kulkarni

Background: Large international studies show that childhood abuse is a risk factor for migraine development; it almost doubles the risk of developing migraine when compared to those without a history of childhood trauma. Previous abuse includes verbal abuse, physical abuse, sexual abuse, neglect, or witnessing confronting experiences. Early trauma may alter neurobiological processes that lower pain thresholds or amplify pain signals. There is no Australian literature regarding the co-prevalence of childhood abuse and the development of migraine.

Aim: To describe the prevalence of past childhood trauma in adults who experience migraine and the most common trauma subtypes.

Methods: Single-centre, prospective, survey-based sampling of adults fulfilling International Classification of Headache Disorders-3 diagnosis of migraine by a neurologist. Patient demographics and self-reported Adverse Childhood Events Questionnaire (ACE-Q) scores were collated and reported as proportions.

Results: Between 1st January 2024 and 20th June 2025, 1218 patients were diagnosed with migraine by a neurologist. Of these, 39% (462/1218) responded to our survey. Respondents were mostly female (376/456, 82%) with a mean age 46.9 years (SD 13.9). Clinically significant (ACE-Q ≥4) was reported by 40% of migraine patients (182/465).Reported trauma types included verbal abuse (32%), parental mental illness (30%), physical abuse (24%), parental divorce (23%), sexual abuse (18%), parental substance abuse (17%), emotional neglect (16%), witnessing parental domestic (12%), physical neglect (8%), and parental incarceration (4%).

Conclusion: Australian adults with migraine commonly report childhood trauma, most commonly verbal abuse. These findings highlight trauma as a potential risk factor for migraine. Future studies examining the timing and severity of trauma may clarify underlying mechanisms and inform trauma-focused therapeutic approaches.

Dr Michael J Hall Memorial Prize for Respiratory Medicine

Endothelial-targeted CD39 prevents Toxin-induced Pulmonary Hypertension in in a Murine Model

Abbey Willcox, Ioanna Savvidou, Natasha Ting Lee, Carly Selan, Ilaria Calvello, Amy Vuong, Simon C. Robson, Viktoria Bongcaron, Aidan Walsh, Yuyang Song, Xiaowei Wang, Trevor Williams, Karlheinz Peter, Maithili Sashindranath and Harshal H Nandurkar

Disruption of the pulmonary endothelium by drugs, toxins, viruses (e.g., COVID-19), or bacterial sepsis can cause acute pulmonary vasculopathy leading to pulmonary hypertension and consequential heart failure. CD39 is a membrane-anchored ecto-enzyme expressed on endothelial cells (EC), integral in maintaining the antithrombotic profile of the endothelium. This ecto-enzyme works in concert with CD73 to hydrolyse both eATP (pro-inflammatory) and ADP (pro-thrombotic) ultimately to adenosine, which is anti-inflammatory, vasodilatory, and antithrombotic. CD39 activity and adenosine signalling are disrupted in idiopathic pulmonary arterial hypertension (PAH). In this work, we explored the efficacy of endothelial cell-targeted delivery of CD39 to prevent the development of acute toxin-induced PAH in a mouse model.

We generated a novel therapeutic anti-VCAM-CD39 containing an scFv recognising VCAM-1 (a receptor expressed on activated EC) fused to the soluble form of extracellular human CD39. In a mouse model of endothelial cell-toxin-induced PAH, we show that a single administration of anti-VCAM-CD39 (0.4 mg/kg IV) prevented the development of PAH— as reflected in the preservation of right ventricular systolic pressures and the absence of right ventricular hypertrophy at day 10 when compared with controls. This protection is conferred by multiple mechanisms: IL-10-driven potentiation of heme oxygenase (HO)-1, a known inhibitor of smooth muscle proliferation; VCAM-1 blockade reduces leukocyte adhesion to the endothelium; and cytoprotective effects through adenosine signalling.Thus, anti-VCAM-CD39 is a novel bifunctional therapeutic strategy for PAH.

Dr Michael J Hall Memorial Prize for Respiratory Medicine

Virtual ethnography of singing for breathing in people with COPD and ILD

Lena Ly, Natasha Smallwood, Peter Hudson, Nicole Goh, Jennifer Philip

Introduction/Aim: Many internationals in-person singing for lung health programs have demonstrated benefits in improving participants' breathlessness and quality of life, but the onset of the pandemic prompted a shift to online delivery. Limited research exists regarding how online delivery of these programs impacts participants' interactions and behaviours. This study evaluated how the digital format influences participant engagement in an Australian-wide program "SINFONIA: A clinical trial examining the benefits of SingINg For breathing in COPD aNd ILD pAtients."

Methods: A virtual ethnographic study was conducted, including observations of 18 participants with chronic obstructive pulmonary disease and interstitial lung disease across 20 weekly 1.5-hour Zoom sessions led by two singing leaders. Analysis of qualitative data yielded descriptive and analytical themes.

Results: Three themes emerged: (1) adaptation and community building; (2) evolution of group dynamics; and (3) dynamics of leadership and influence. As the singing program progressed, participants formed social connections that transcended geographical limitations, both facilitated and inhibited by online delivery. The program fostered a supportive environment where participants could normalise their conditions, thus challenging stigmas and promoting resilience within the evolving group dynamics, which were shaped by the leaders.

Conclusion: Evolving relationships and group dynamics were observed, emphasising the importance of managing online group social dynamics and balancing guidance with participant autonomy in future programs.

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Professor Daniel Czarny Prize for Allergy, Asthma and Clinical Immunology

Impaired Humoral Immune Memory Formation After COVID-19 Booster Vaccination in Patients with Inflammatory Bowel Disease Receiving Anti-TNF Treatment

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Background: Yearly booster vaccinations are recommended to improve protection against severe COVID-19, particularly in immunocompromised people. In general, vaccines may be poorly immunogenic in the immunocompromised, but this is mainly based on antibody responses; the formation of memory B cells (Bmem) is not well defined. Here, we evaluated Bmem and antibody responses in patients with inflammatory bowel disease (IBD) receiving anti-TNF treatment after COVID-19 booster vaccination.

Methodology: Blood was sampled at baseline,1- and 6 months after BA.5 bivalent or XBB.1.5 monovalent booster vaccination from 41 healthy controls and 25 IBD patients receiving intravenous Infliximab. Neutralising antibodies were assessed using a plaque reduction assay. Recombinant SARS-CoV-2 Spike receptor binding domain (RBD) proteins from ancestral, Omicron BA.1, BA.5, XBB.1.5 and JN.1 variants were produced for ELISA-based serology to quantify RBD-specific serum IgG and tetramerised for immunophenotyping of Bmem using flow cytometry.

Results: Ancestral and variant-specific serum IgG and neutralising antibodies in patients significantly increased from pre to 1-month post vaccination but were significantly lower compared to controls. The numbers of ancestral-, BA.5- and XBB.1.5-specific Bmem in patients increased after vaccination but were still significantly lower than controls. Within RBD-specific Bmem, the frequencies of recently activated CD21lo cells were increased after vaccination; however, patients had significantly higher frequencies of CD21lo cells than controls. Ig isotype distributions of antigen-specific Bmem in patients were different from controls with fewer cells expressing IgG4, and more expressing IgG3, IgD and IgM following vaccination. The capacity of RBD-specific Bmem to bind multiple viral variants was increased after vaccination; however, patients had significantly lower numbers of vaccine-specific Bmem that could bind to newer Omicron subvariants than controls.

Conclusion: Infliximab-treated IBD patients have a reduced capacity to generate antibodies and Bmem after COVID-19 booster vaccination, suggesting that overall immunogenicity is reduced in patients.

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Third Dose Covid-19 Vaccination Elicits Immune Memory Regardless of Neutralising Antibody Generation In Patients with Inborn Errors of Immunity

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Objective: Primary immunodeficient (PID) patients may have poor vaccination responses and high susceptibility to severe infections, including COVID-19. Our objective was to evaluate the SARS-COV-2-specific IgG, memory B cells (Bmem) and memory T cells (Tmem) following COVID-19 vaccination to ascertain whether third dose COVID-19 vaccination is effective in generating immune memory in PID patients.

Design and Methods: 25 PID patients and 29 healthy controls were sampled one-month after doses two and three of the COVID-19 vaccination. Serum neutralising antibody (NAb) titers were determined in live virus assays. Using recombinant spike receptor-binding domains (RBD), we analysed plasma IgG by ELISA and Bmem by flowcytometry directed against ancestral and Omicron variants. Using overlapping peptide pools for the ancestral spike protein, we analysed activation induced marker expression on the surface of CD4+ and CD8+ T cells.

Results: Regardless of mRNA or adenoviral vector vaccine priming, ancestral RBD-specific IgG levels and Nab titers were significantly lower in PID patients than controls after both doses, with minimal boosting at dose 3. Ancestral RBD-specific IgG and Nab crossrecognition of Omicron BA.5 were lower in patients than controls after both doses, with boosting evident at dose 3 in both cohorts.

Despite normal total Bmem numbers, patients had fewer ancestral RBD-specific Bmem and reduced cross-recognition of both Omicron BA.2 and BA.5. Patients had increased frequencies of RBD-specific Bmem expressing CD71, and lower frequencies of IgG- and IgA-expressing RBD-specific Bmem.

Total and spike-specific CD8+ Tmem were lower in patients than controls after both doses, with significant boosting upon dose 3. Spike-specific CD4+ Tmem of patients expressed lower CD69 expression and contained lower frequencies of IFNγ+TNFα+ cells than controls.
Compared to patients who had seroconverted at dose 3, those patients lacking an NAb response exhibited a lower number of spike-specific CD4+ Tmem and RBD-specific Bmem. Whilst numbers of spike-specific CD8+ T mem numbers were similar between both groups.

Conclusions: Together, a large fraction of adult PID patients have an impaired vaccine response to COVID-19. Most patients demonstrate an intact spike-specific CD4+ and/or CD8+ Tmem response, whereas antibody, NAb and Bmem responses are frequently reduced. Therefore, measurement of cellular responses may better reflect immune competence, and are likely scalable for routine evaluation of responses to vaccination and infection. Furthermore, unlike antibody and NAb measurement, quantification of Tmem and Bmem responses are unaffected by receipt of immunoglobulin replacement therapy.

Professor Daniel Czarny Prize for Allergy, Asthma and Clinical Immunology

Functional Assessment of the Nod2 Signalling Pathway in Patients with Inborn Errors of Immunity

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Background: Majority of patients with inborn errors of immunity (IEI) lack identification of disease-causing genetic variants. Causal defects affect limited immune pathways, including NOD2 signalling. To advance diagnostics, we developed an ex-vivo functional assay to evaluate NOD2 signalling, enabling validation of variants of unknown significance, and providing functional insights in patients without a causal defect.

Methods: Blood monocytes from 14 healthy donors, 27 IEI patients lacking a causal variant, and three patients with a hemizygous variant in X-linked Inhibitor of Apoptosis (XIAP) were stimulated with L18-MDP (NOD2-dependent), or LPS (NOD2-independent), or left unstimulated. TNF-α, phosphorylated-p38 (p-p38) and p-p65 were measured via flow cytometry. WES was performed on all patients.

Results: In healthy donors, L18-MDP induced TNF-α production in 58% (range 22.2-90.1%) of monocytes, and a fold-change (relative to LPS stimulation) in median fluorescence intensity (MFI) of 1.04 (range 0.69-1.3) and 0.80 (range 0.67-0.98) for p-p38 and p-p65. Patients with XIAP variant had 0% (0%-0.63%) of monocytes producing TNF-α, and MFI fold-change of 0.64 (0.5-0.79) and 0.50 (0.27-0.64) of p-p38 and p-p65, respectively. No significant difference was observed between healthy donor and genetically unexplained patients. Of the 27 patients, 15 had at least one read-out outside of the healthy donor range. Initial WES analysis showed these 15 patients had a median of 8 rare (minor allele frequency, MAF <0.01), or 3 ultra-rare (MAF <0.001) variants in the 397 NOD2 signalling pathway genes.

Conclusion: Assessment of NOD2-dependent TNF-α, p-p38 and p-p65 can identify patients with potential abnormal NOD2 pathway function, supporting exploration of rare NOD2 pathway gene variants. Future analysis will involve in-silico and in-vitro evaluation of these variants to determine causality. A pathway-focused approach, such as described here, could streamline candidate variant identification and thus increase genetic diagnosis rates in IEI and other rare diseases.

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Muscle Sympathetic Nerve Activity in Drug-Resistant Epilepsy Patients with and Without Vagus Nerve Stimulation

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Drug-resistant epilepsy (DRE) is associated with high cardiovascular risk, which is known to be reduced by vagus nerve stimulation (VNS). Given that elevated cardiovascular risk is associated with elevated sympathetic outflow, we tested the hypothesis that muscle sympathetic nerve activity (MSNA) is reduced by VNS in people with DRE.

Aim: To determine the effect of VNS on MSNA in DRE patients with implanted VNS devices.

Methods: Direct recordings of MSNA were made via tungsten microelectrodes inserted percutaneously into the common peroneal nerve in 16 DRE patients without and 11 with VNS and 11 healthy age- and sex- matched controls free from neurological and cardiovascular disease. Spontaneous bursts of MSNA, continuous measurements of blood pressure, respiration and electrocardiogram were recorded concurrently during quiet breathing. Burst frequency (BF, bursts/minute), burst incidence (BI, bursts/100 heartbeats), neurovascular transduction, and sympathetic and cardiac baroreflex gains were calculated.

Results: MSNA BF and BI were significantly reduced in DRE patients with VNS compared to those without VNS. BF and BI were also markedly reduced in VNS patients compared to controls. There were no significant differences in baroreflex gains or neurovascular transduction between VNS patients and DRE patients.

Conclusion: This study for the first time directly quantified sympathetic activity in DRE with VNS. Here we show that VNS patients have lower sympathetic activity than DRE patients without VNS. We also show that VNS appears to reduce MSNA in DRE patients to levels lower than age and sex-matched controls, which may be a contributing factor to how VNS reduces cardiovascular risk in DRE patients and why these patients have lower rates of sudden unexpected death in epilepsy (SUDEP) compared to DRE patients not receiving vagus stimulation therapy.

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The Prognostic Value of RV-PA Coupling In Heart Failure with Preserved Ejection Fraction

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Background: TAPSE/RVSP is an emerging non-invasive marker of RV–PA coupling, with worse coupling linked to adverse outcomes in cardiovascular disease yet remains understudied in HFpEF.

Methods: We retrospectively analysed 15,243 patients with HFpEF from Alfred Health (2000–2024). Comorbidities were identified using ICD-10AM codes. Mortality was obtained via linkage with Centre for Victorian Data Linkage. HFpEF defined as LVEF >50% plus ≥1 of LAVI >34 ml/m², TRV >2.8 m/s, E/e' >9, or invasive PCWP >15mmHg at rest or >25mmHg at exercise. Excluding infiltrative, hypertrophic, or valvular cardiomyopathies and prior heart transplantation.

Results: Mean age was 68±14years, 47% female, and BMI 27±5.5 kg/m2. Comorbidities included 50% hypertension, 20% diabetes, 23% IHD. Over 5.4±3.7years follow-up, mortality was 25% (n=3794), of which 26% were cardiovascular. TAPSE/RVSP was lower in those who died (0.62±0.25 vs. 0.79±0.27mm/mmHg, p<0.001). Kaplan–Meier curves showed stepwise separation across TAPSE/RVSP categories, with divergence below 0.50mm/mmHg and <0.35mm/mmHg demonstrating the poorest survival (p<0.0001). Multivariable Cox model adjusted for age, sex, BMI, left atrial volume index, LV mass index, right atrial volume index, RV base diameter, and RV s', found each 0.3mm/mmHg decrease in TAPSE/RVSP was independently associated with higher risk of all-cause mortality at 1, 3, and 5 years (HR 1.20 [95% CI 1.16–1.25], HR 1.18 [1.13–1.23], and HR 1.16 [1.11–1.21], respectively). Restricted cubic spline modelling revealed a near-exponential hazard rise below 0.70mm/mmHg. Diagnostic cut-points of 0.71mm/mmHg (HR 1.11 95%CI 1.07–1.16, sensitivity 65%, specificity 61%, NPV 91%) and 0.50mm/mmHg (HR 1.94 95%CI 1.82–2.06, sensitivity 32%, specificity 86%, NPV 88%) were identified, with <0.50mm/mmHg offering the most clinically meaningful risk discrimination.

Conclusion: In this large HFpEF cohort, TAPSE/RVSP was a powerful independent predictor of prognosis, with values <0.50mm/mmHg marking high risk of long-term all-cause and cardiovascular death, underscoring the importance of this non-invasive metric.

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Mechanical Forces in Tissue Drive Immunosenescence of Macrophages Via Piezo1/Calpain-Mediated Mechanotransduction

Manijeh Khanmohammadi and Sara Baratchi

Vascular stiffening is a hallmark of ageing and a major risk factor for cardiovascular disease and dementia. Loss of vascular elasticity alters hemodynamic forces and changes the mechanical environment of immune cells recruited to the vessel wall. Despite its clinical importance, the mechanisms by which biomechanical stress shapes immune cell behaviour remain poorly understood.

This study examined how matrix stiffness and cyclic tensile force influence macrophage senescence, metabolism, and inflammatory function. Human peripheral blood mononuclear cells were differentiated into macrophages on elastomeric substrates with defined stiffness (2, 25, 100 kPa) and subjected to cyclic stretch (0%, 5%, 10% strain, 1 Hz, 48 h) using a custom 3D-printed device.

Macrophages displayed pronounced mechanosensitivity. Increasing stretch intensity triggered a senescence program marked by SA-β-gal activity, p16^INK4A, p21, and γ-H2AX expression. Stretch also impaired mitochondrial function, as shown by reduced ATP production and a lower mitochondrial membrane potential, indicating bioenergetic decline. In addition, cyclic stretch disrupted cholesterol efflux by degrading the transporters ABCG1 and ABCA1, thereby promoting foam cell formation, a central feature of atherosclerosis. Mechanostimulated macrophages further adopted a pro-inflammatory phenotype, with elevated TNFα, IL-1β, IFNβ1, CXCL1, and CD80 expression. Mechanistic studies revealed that these responses were mediated through calpain activity and activation of the mechanosensitive ion channel Piezo1.

Together, these findings demonstrate that biomechanical cues are powerful regulators of macrophage ageing, metabolism, and inflammatory activity. By linking vascular stiffness and mechanical stretch to foam cell formation and vascular inflammation, this study provides novel mechanistic insight into the progression of atherosclerosis. Targeting mechanotransduction pathways such as calpain and Piezo1 may open new therapeutic avenues to prevent or slow cardiovascular disease associated with vascular stiffening and ageing.

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Unlocking The Architecture and Component Distribution of Highly Potential Red Blood Cell-Derived Colloidal Structures in Medical Applications

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Background: Red blood cell (RBC)-derived biomaterials including extracellular vesicles (RBCEVs) and RBC ghosts have immense potential in drug delivery and imaging-based diagnostics due to their high biocompatibility, tunable cargo-loading capabilities, and immune stealthing capacity. To fully exploit their potential, high-resolution insight into their structural and compositional features is critical.

Methods: Here, we apply cutting-edge small- and ultra-small-angle neutron scattering (SANS/USANS) with contrast variation (CV) to mask out background thus could uniquely resolve the membrane and internal organization of RBCEVs and RBC ghosts that are often inaccessible by conventional microscopy, spectroscopy or other techniques. Vesicle-depleted human plasma and human serum albumin were incorporated as protein references, to better represent in vivo components and condition.

Results: SANS identified key contrast match points for lipids (0.5×10^{-6} Å^{-2}), proteins (2×10^{-6} Å^{-2}), and cell membrane mixed lipid–protein phases ($\sim1.4\times10^{-6}$ Å^{-2}). RBCEVs were resolved as spherical vesicles with a 257 nm diameter and a 3 nm lipid bilayer. Our analysis showed that RBC ghosts represent pure cell membranes devoid of encapsulates, while ≈87% of RBCEV volume comprises internal water, with 10% attributable to encapsulated proteins. Notably, the internal water of RBCEVs exchanges with the surrounding solvent, indicating membrane permeability and deformability—features that likely facilitate passage across biological barriers. SANS revealed differences in structural organization between RBCEV membranes and RBC ghosts. RBC ghosts exhibited two distinct lamellar thicknesses, while RBCEVs contained a single, thinner bilayer—findings corroborated by cryoTEM.

Conclusion: Our integrative workflow demonstrates how CV-SANS/USANS can decode the structural complexity of soft colloidal systems, going beyond surface morphology to reveal internal architecture and dynamic composition. The findings in this study pave the way for rational design of functional blood-derived nanomaterials in drug delivery and molecular imaging and can be broadly applicable to other EV classes and lipid nanoparticles.

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Association Between Exposure During Pregnancy and Infancy to Extreme Particulate Matter and Blood Pressure in Later Childhood

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Background: Evidence on long-term effects of early-life exposure to acute, high-intensity air pollution, such as wildfire smoke, on later blood pressure remains limited.

Aim: To assess the association between exposure to fine particulate matter ($PM_{2.5}$) from the 2014 Hazelwood coal mine fire during pregnancy and infancy, and blood pressure in later childhood.

Methods: Children born between March 2012 and December 2015, exposed to varying levels of Hazelwood fire smoke and classified into three groups: in utero exposure (n=100), infancy exposure (birth–2 years, n=122) and not/minimally exposed (n=71), undertook brachial and central blood pressure assessments at 3, 7 and 9 years after the fire. Individual mean and maximum daily fire-related $PM_{2.5}$ exposures were estimated by mapping time-location diaries to modelled $PM_{2.5}$ estimates. Multivariable mixed-effects linear regression, adjusted for potential confounders, was used for analysis. Rate of change in blood pressure measurements from 3 to 9 years after the fire was conducted by comparing exposed with unexposed children.

Results: In infancy-exposed children, each 10 µg/m^3 increase in mean daily $PM_{2.5}$ and each 100µg/m^3 increase in peak daily $PM_{2.5}$ were associated with increases in central Diastolic Blood Pressure (DBP) at 9-year follow-up of 2.48 mmHg (95% CI: 0.73–4.88; P=0.044) and 1.85 mmHg (95% CI: 0.10–3.60; p=0.039), respectively. Exposure to elevated $PM_{2.5}$ levels during infancy was also associated with annual increases from 3- to 9-year follow-ups in brachial Systolic Blood Pressure (SBP) (2.18 mmHg [95% CI: 1.11–3.24]), brachial DBP (1.90 mmHg, [95% CI: 0.95–2.86]), central SBP (1.58 mmHg [95% CI: 0.59–2.56]) and central DBP (1.86 mmHg [95% CI: 0.85–2.88]) compared with not/minimally exposed children.

Conclusions: Exposure to high levels of air pollution during infancy was associated with increased blood pressure in later childhood. Protecting vulnerable populations during severe air pollution events may help reduce future cardiovascular risk.

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Benefits of Physical Activity for Women with Insomnia Symptoms and Female Specific Cardiovascular Risk Factors: Evidence from the Uk Biobank Cohort

Zhaleh Ataei, Leah Wright, Sergio Ruiz-Carmona, Erin J Howden

Aim: Insomnia is a common sleep disorder in women, independently increasing the risk of cardiovascular disease (CVD) through mechanisms like inflammation. We investigated whether insomnia symptoms further increased the risk of CVD in women with female-specific CVD risk factors: early menopause or complicated pregnancy. Further, as insomnia is a potentially modifiable risk factor, we investigated whether physical activity (PA) attenuated this risk.

Method: We included 43,915 women from the UK Biobank cohort with female-specific CVD risk factors (early menopause (< 45 years) and/or complicated pregnancy (history of gestational diabetes, hypertensive disorders of pregnancy, stillbirth or ³ two miscarriages)). Insomnia was defined as trouble falling asleep or waking up at night (82%). Women with PA information were categorised into three PA groups based on self-reported data: high (> 3000 MET-min/week), moderate (> 600 MET-min/week) and low. Outcomes were risk of incident heart failure (HF), arrhythmia, coronary artery disease (CAD) and ischemic stroke.

Results: In adjusted models, insomnia symptoms significantly increased the risk of HF (39%), arrhythmia (12%) and CAD (27%); however, no significant association was observed between ischemic stroke and insomnia symptoms. Moderate and high PA levels significantly reduced the risk of HF (HR 0.80, 95% CI 0.66 0.98 and HR 0.77, 95% CI 0.62 0.95, respectively) and arrhythmia (HR 0.80, 95% CI 0.70 0.91, HR 0.79, 95% CI 0.69 0.91, respectively) compared to low PA levels. No significant association was found between PA and ischemic stroke/CAD risk.

Conclusion: Insomnia symptoms further increase the risk of most CVD outcomes in women with female-specific CVD risk factors, while PA levels consistent with the current guidelines reduce the risk of HF and arrhythmia in this population. Therefore, PA should be recommended to all women, specifically those with female-specific CVD risk factors and insomnia symptoms.

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Reduced PI3K(p110α) Signalling in Cardiomyocytes Modulates Atrial Collagen Expression and Alters the Molecular Composition of Cardiac-Derived Extracellular Vesicles

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Introduction: Phosphoinositide 3-Kinase (PI3K, p110α) is a lipid kinase with cardioprotective roles. Extracellular vehicles (EVs) mediate intercellular communication, maintaining cardiac function, however, pathological changes in their composition can contribute to cardiovascular disease progression.

Aim: To assess how reduced PI3K(p110α) activity impacts atrial fibrosis and the composition of cardiac-derived EVs.

Methods: Two transgenic mouse models (aged~12,20,30-weeks) expressing cardiac-specific dominant-negative PI3K (dnPI3K) mutations were generated: heterozygous dnPI3K (one dnPI3K transgene) and homozygous dnPI3K (two transgenes). Heterozygotes display smaller hearts without pathology under basal conditions, while homozygotes develop progressive cardiac dysfunction, including fibrosis, atrial enlargement, and thrombi. Fibrosis was assessed in atrial tissue (20,30-weeks, n=8/group) using immunohistochemistry (Collagen I/III) and Picrosirius red staining. DnPI3K heart perfusates (12-weeks, n=4-8/group) were collected via Langendorff perfusion to isolate EVs for proteomics.

Results: Fibrotic staining of 20 and 30-week homozygote mouse atria showed increased collagen deposition. Collagen I was increased in female homozygotes vs. Ntg (p=0.009,0.046) and males (p<0.0001,0.001). Collagen III was higher in homozygotes vs. Ntg in females (p=0.04,0.07) and males (p=0.0003,0.002). Picrosirius red staining confirmed fibrosis in homozygote females (p=0.002,0.001) and males (p=0.004,0.003) at 20-weeks, with both sexes showing increases at 30-weeks (p=0.05,0.01). Proteomic profiling of cardiac-derived EVs revealed distinct dnPI3K signatures. Gene ontology analysis identified sex-specific differences: male heterozygote EVs showed enhanced mitochondrial and lipid metabolism, while male homozygotes exhibited impaired respiration and glycerolipid metabolism, and activated fibrotic and structural pathways, including ECM-receptor interaction. Female heterozygote EVs showed upregulated cellular regulation pathways, including vesicle-mediated transport. Female homozygote EVs displayed reduced cardiac contractility processes such as calcium ion import.

Conclusion: Reduced PI3K(p110α) activity altered atrial collagen expression and cardiac EV content in heterozygote and homozygote mice. Atrial fibrosis was only present in homozygote mice. PI3K(p110α) influenced EV proteins linked to mitochondrial and metabolic pathways, suggesting potential diagnostic or therapeutic targets. Functional studies are ongoing.

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T Cell blockade with Abatacept preserves cardiac function following Ischemia-Reperfusion Injury

Candice Todd

Myocardial Infarction (MI) is a leading cause of death worldwide. While reperfusion via percutaneous coronary intervention improves survival, it paradoxically induces inflammatory cardiac ischemia-reperfusion injury (cIRI), promoting further damage and heart failure. Currently, no therapies specifically target this inflammatory response. To model cIRI, mice underwent temporary LAD coronary artery ligation followed by reperfusion. To test the role of T cells and a potential therapy, we administered abatacept (Orencia®), which blocks a critical co-stimulatory signal for T cell activation. Immune responses were assessed by flow cytometry, and cardiac function was monitored over four weeks using echocardiography and strain analysis. Seven days post-cIRI, we observed marked innate and adaptive immune activation, including an expansion of inflammatory CXCR3+ CD4+ effector memory T cells ($p<0.0001$). This induction of inflammatory T cell immunity was near-completely suppressed by abatacept treatment. Hearts from abatacept-treated mice had significantly decreased numbers of infiltrating $CD4^{+}$-activated effector memory T cells, as well as innate immune cells (e.g., inflammatory $Ly6^{Hi}$ monocytes) compared to vehicle-treated mice. It also prevented induction of TNFα- and IFNγ-producing T cells, cytokines known to drive cardiac damage. Functionally, abatacept-treated mice exhibited preserved ejection fraction (50% vs 35%, $p<0.0001$) and near-normal strain patterns, compared to vehicle controls with pronounced dysfunction. Importantly, delayed administration one day after reperfusion also conferred strong cardioprotection. Our data identify T cells as central mediators of cIRI and establish abatacept as a promising candidate for preventing post-MI heart failure. Repurposing this established therapy could address an urgent unmet need in cardiovascular medicine.

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The Ceiling Effect of Pharmacotherapy in Ventricular Recovery for Atrial Fibrillation Mediated Cardiomyopathy

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Background: Atrial fibrillation–mediated cardiomyopathy (AFCM) is a reversible form of heart failure (HF) in which atrial fibrillation (AF) precipitates left ventricular (LV) dysfunction. While guideline-directed medical therapy (GDMT) is standard of care, the extent to which GDMT alone contributes to LV recovery prior to rhythm control is uncertain. We evaluated the trajectory of LV ejection fraction (LVEF) across GDMT initiation and catheter ablation in the CAMERA-MRI and CAMERA-MRI II cohort.

Methods: Patients were included if ≥2 LVEF measurements were available prior to ablation and were late gadolinium enhancement (LGE)-ve. Only LGE-ve patients were included, representing a primary AFCM phenotype without additional causes for HF. LVEF was assessed at HF diagnosis (TBaseline), post-GDMT (TGDMT), post-ablation (TPost-Ablation), and long-term follow-up (TLongterm). Rhythm status, heart rate, and GDMT use were recorded. Predictors of LVEF recovery were analysed.

Results: Sixty-two patients were included (mean age 59.5±10.5 years, 8.1% female, baseline LVEF 31.8±8.6%). GDMT use included β-blocker 91.9%, ACE/ARB 74.2%, MRA 51.6%, ARNI 21.0%, and SGLT2 6.5%. Median time intervals were 83 days from TBaseline–TGDMT, 214 days from TGDMT–TPost-Ablation, and 171 days from TPost-Ablation–TLongterm. Heart rate declined with GDMT (P=0.007) and further after ablation (P<0.001). LVEF did not significantly improve with GDMT (31.8±8.6 vs 33.3±8.8, P=0.24), but improved markedly post-ablation (53.5±10.5, P<0.001), with sustained recovery at follow-up (55.4±9.6). Of 31 patients with LVEF ≤35% post-GDMT, 87.1% improved beyond this threshold after ablation. Rhythm restoration predicted recovery (P=0.013), whereas GDMT exposure did not.

Conclusion: In AFCM, LVEF recovery predominantly occurs following rhythm restoration by catheter ablation, with minimal improvement on GDMT alone. These findings suggest GDMT up-titration should not delay ablation and highlight ablation's role in reversing LV dysfunction and potentially avoiding defibrillator implantation thresholds. Early rhythm control should be prioritised in AFCM.

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Expedited Extracorporeal Cardiopulmonary Resuscitation for Acute Coronary Syndrome-Precipitated Cardiac Arrest: A Novel Translational Porcine Model

Candice Todd, Sasha Migus, Scott Loh, Jason Bloom, Ramin Odisho, Aascha D'Elia, Akshima Dogra, Anita Thomas, Kyah Grigolon, Shane Nanayakkara, Dion Stub, Brooke Riley, Aidan Burrell, David Kaye, Daniel Donner

Patients experiencing cardiac arrest (CA) may benefit from rapid extracorporeal cardiopulmonary resuscitation (ECPR) as a bridge to definitive care, such as percutaneous coronary intervention (PCI) for acute coronary syndrome (ACS). Optimising this contemporary resuscitative pathway in clinical settings is challenging.

Aim: To develop and characterise a closed-chest porcine model of ACS-induced sustained CA treated with conventional cardiopulmonary resuscitation (C-CPR), expedited ECPR therapy, and early PCI (<90 minutes).

Methods: This project was approved by the local Animal Ethics Committee. Nine female large white pigs (54.96±1.95 kg) were intubated, instrumented, and stabilised. ACS was induced by occluding the left anterior coronary artery with a percutaneous balloon. After 20min, ventricular fibrillation (CA) was electrically induced. Following 5 min of untreated CA, all animals received a 15min intervention period of C-CPR comprising of external chest compressions 102/min (LUCAS III, Stryker) and vasopressor (adrenaline) support. ECPR therapy then commenced for a 60min intervention period and PCI performed 70min post initial ACS. Experimental variables included haemodynamic, biochemical and echocardiographic parameters.

Results: Baseline variables were comparable between all subjects; mean arterial pressure (MAP) 73.01±7.61 mmHg, serum lactate 1.52± 0.33 mmol/L, left ventricular fractional shortening 29.95±1.83 %. Within 10min of CA, arterial $p0_2$ (164.50±31.32 vs 417.80±48.62 mmHg baseline, p=0.0261), and serum lactate (3.50±0.49 vs 1.59±0.40 mmol/L pre-CA, p=0.0345) were indicative of global hypoxic insult and lactic metabolic acidosis, despite delivery of C-CPR. However, C-CPR generated physiological haemodynamic support within 5min; MAP 48.05±6.08 vs 52.56±4.16 mmHg pre-CA, p=0.9942). Commencement of ECPR therapy recovered both MAP (44.34±6.09 vs 52.56±4.16 mmHg pre-CA, p=0.9983) and arterial $p0_2$ (453.50±35.73 vs 164.50±31.32 mmHg mCPR +5min, p=0.0055) within 10min.

Conclusion: Our study describes a novel, closed-chest porcine model of ACS-precipitated CA. During sustained CA, C-CPR delivery generated physiological haemodynamic support, whilst ECPR therapy rapidly restored haemodynamic support and blood oxygenation to within pre-arrest physiological range.

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A disease-mimicking in vitro model of aortic valve stenosis to investigate the drivers of endothelial-mesenchymal transition

Y. Mirzaalikhan, A. Lai, M. Khanmohammadi, C. Chheang, A. Mirabedini, S. Houshyar, A. Watson, N. Dayawansa, K. Pete, S. Baratchi

Calcific aortic valve disease (CAVD) is a prevalent heart valve disorder globally, characterised by thickening and stiffening of the valve leaflets, which limits blood flow and leads to aortic stenosis. The disease is driven by a multifaceted pathological process involving immune cell infiltration, extracellular matrix (ECM) remodelling, endothelial-to-mesenchymal transition (EndMT) and calcification. ECM changes lead to valve thickenings, altered collagen organisation, elastin fragmentation, and proteoglycans and glycosaminoglycan (GAG) enrichment, such as hyaluronic acid (HA) and chondroitin sulphate (CS). Despite growing knowledge, valve replacement remains the only treatment option, with gaps in understanding persisting.

In this study, we developed a new in vitro model to mimic different stages of disease. While previous studies have demonstrated that incorporating glycosaminoglycan into collagen hydrogels, without mechanical stimulation, can significantly promote EndMT, the combined effects of GAGs enrichment and physiologically relevant cyclic stretch on human aortic valvular endothelial cell behaviour have not yet been investigated. This study provides a more physiologically relevant model to investigate how mechanical and biochemical cues together regulate cells behaviour during disease progression. Using this model, we investigated how extracellular matrix remodelling, such as enrichment with HA or CS, and mechanical forces, influence endothelial cells. We observed that high levels of GAGs, involved in extracellular matrix organisation, combined with low mechanical forces, promoted EndMT transition as evidenced by increased expression of vWF, CD31, αSMA, and MMP9, suggesting a transitional phenotype characteristic of disease progression. Additionally, GAGs enrichment and stretch intensity influenced the expression of inflammatory markers, and subsequent monocyte adhesion and transmigration. To validate our in vitro findings, we analysed aortic valve tissues from CAVD patients and healthy donors, confirming key inflammatory and structural changes observed in vitro.

These findings suggest insights into how mechanical and biochemical cues contribute to vascular inflammation and CAVD progression.

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At the Heart of Home-Based Care: Multidisciplinary Heart Failure Management in a Quaternary Centre's Community Programs

Elana Forbes, Ingrid Hopper, Cathy Corbett, Felice Borghmans, Emma O'Donnell, Ana Slavnic, Genevieve Harvey, Elizabeth Rochford and Archana Thayaparan

Background: Heart Failure (HF) is a frequent cause of hospital admissions, carrying a high risk of hospital readmission and mortality. Alfred Health General Medicine Hospital in the Home (GM-HITH) and Hospital Admission Risk Program (HARP) offer multidisciplinary HF care to multi-morbid patients in bed-substitution and non-admitted community care models.

Aims: To characterise delivery of care to patients with HF within Alfred Health GM-HITH and HARP across four domains: symptom management, patient education and self-management, optimisation of guideline-directed medical therapy (GDMT), and values-based discussions regarding disease trajectory and advance care planning.

Methods: A single-centre retrospective cohort study was conducted on every second HF patient discharged from HARP between July 1 to August 31, 2024. Data were collected from electronic medical records, and summary statistics provided.

Results: 48 patients were included. Mean age was 82 and mean Charleson Comorbidity Index score was 6. HF was a new diagnosis for 23%, and ejection fraction was preserved in 46%. 88% were hospitalised in the preceding 12 months, and 67% required in-home assistance. HF education was provided to 98% patients without a uniform approach to symptom monitoring. Patients were infrequently considered for GDMT optimisation. Six patients were deceased at the time of data collection, typically without documented discussion about HF prognosis or advance care planning by the community team.

Conclusions: Community-based HF care consistently delivered HF education and occasionally considered GDMT optimisation. This elderly and multi-morbid patient cohort would likely benefit from greater opportunity for shared decision making and early introduction of palliative care services.

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Hospital Volume and Outcomes of Septal Myectomy for Treatment of Hypertrophic Cardiomyopathy

Wang Y, Tran L, Reid CM, Ellims A, Bailey M, Marasco SF

Previous studies have reported an inverse relationship between hospital septal myectomy (SM) volume and outcomes, without evaluations of surgeon volume and SM outcomes.

Aim: This Australia- and New Zealand-based study sought to appraise the relationships between hospital volume, surgeon volume, and SM outcomes.

Methods: Data were collected from the Australian and New Zealand Society of Cardiac and Thoracic Surgeons (ANZSCTS) Database, from the time of inception of the ANZSCTS Database (2001) up until 01/01/2021. Hospitals were divided into the lowest (1-3 cases), middle (4-6 cases), and highest tertiles (>6 cases) based on their annual SM case volume.

Results: This study cohort included 1132 patients and 115 surgeons. The surgeon volume ranged from 1 to 91 cases in total. The overall 30-day mortality after SM was 2.2%, and the rate of new-onset complete heart block requiring permanent pacemaker (PPM) was 7.5%. Concomitant mitral valve repair and mitral valve replacement (MVR) were performed in 8.1% and 11.7% of patients, respectively. Concomitant MVR was associated with increased mortality. Septal myectomy performed at low-volume centers had a significantly higher mortality rate (4.9%) than at the middle- (1.3%, p=0.002) and the high-volume centers (1.1%, p=0.004). Surgeons who performed SM on patients who subsequently died within 30 days of SM had significantly lower case volume compared to surgeons who performed SM on patients who were alive.

Conclusion: This study highlights the importance of both center and surgeon case volume in outcomes after septal myectomy.

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Radial Artery Conduit Use After Transradial Catheterization

Wang Y, Bailey M, Marasco SF

Transradial catheterization via the radial artery (RA) is now the default approach for coronary angiography, but transradial catheterization is known to be associated with RA endothelial damage and vasodilatory dysfunction. Radial artery is also a popular choice of conduit for coronary artery bypass grafting. To date, there is insufficient evidence regarding the impact of TRC on RA graft patency.

Aim: To evaluate the impact of TRC on RA graft patency and identify factors associated with previously catheterized RA graft patency.

Methods: This retrospective cohort study of patients who underwent coronary artery bypass grafting with previously catheterized RA grafts was conducted at two major hospitals in Victoria, Australia. Graft patency was assessed with either invasive or computed tomography coronary angiography.

Results: Sixty-eight patients were studied, all of whom had bilateral radial arteries harvested, of which all right radial arteries had been previously catheterized for angiography. Grafts included sequential and Y grafts leading to 90 left radial artery (LRA) grafts and 76 right radial artery (RRA) grafts studied. Previously catheterized RRA grafts had significantly lower patency (72%) than non-catheterized LRA grafts (87%, p=0.02). Female sex, peripheral vascular disease, and a history of myocardial infarction were associated with RRA graft occlusion. Severe right coronary artery stenosis was associated with RRA graft patency.

Conclusion: Previously catheterized RRA grafts may have a lower patency rate than non-catheterized LRA grafts. However, previously catheterized radial arteries remain a useful conduit option especially when other conduit choices are limited.

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Incidence, Predictors, and Outcomes of Patient-Prosthesis Mismatch After Surgical Aortic Valve Replacement

Wang Y, Vu T, Sharma V, Tran L, Reid CM, Bailey M, Marasco SF

Patient-prosthesis mismatch can occur following surgical aortic valve replacement, which has detrimental impacts on patient outcomes.

Aim: To evaluate the incidence, predictors, and clinical outcomes of patient-prosthesis mismatch after surgical aortic valve replacement using the binational Australian and New Zealand Society of Cardiac and Thoracic Surgeons Database.

Methods: Data from all adult patients undergoing surgical aortic valve replacement between 2001 and 2021 across 58 participating hospitals in the Database were included. Effective orifice areas of the prosthetic valves were collected from the manufacturer's specifications and existing literature. Patient-prosthesis mismatch was classified by indexed effective orifice areas: no mismatch (>0.85 cm^2/m^2), moderate mismatch (0.66-0.85 cm^2/m^2), and severe mismatch (≤0.65 cm^2/m^2).

Results: We included 36,150 patients in the study, of whom 19,330 (53.5%) had no mismatch, 15,405 (42.6%) had moderate mismatch, and 1,415 (3.9%) had severe mismatch. Predictors of mismatch include older age, larger body surface area, diabetes, hypertension, poorer New York Heart Association class, earlier year of operation, urgent operation, and bioprostheses use. Patients with severe mismatch had the highest 30-day mortality (4.5%; moderate mismatch 3%; no mismatch 2.4%; $p<0.0001$). Both moderate and severe mismatch were associated with significantly increased long-term mortality ($p=0.0003$) and reduced long-term survival (log-rank $p<0.0001$).

Conclusion: Moderate patient-prosthesis mismatch is common following surgical aortic valve replacement. Older age, larger body surface area, diabetes, hypertension, poorer New York Heart Association class, earlier year of surgery, urgent operation status, and the use of bioprosthetic valves were associated with mismatch. Patient-prosthesis mismatch of any severity was associated with an increased risk of short- and long-term mortality, and worse survival.

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Investigating The Effect of Shear Stress on the Formation Of Monocyte Extracellular Trap (MET)

Danish H, Khanmohammadi M, Mirzaalikhan Y, Chheang C, Lai A, Dayawansa N, McQualter J, Peter K, Baratchi B

Aortic stenosis (AS) is a leading cause of morbidity in individuals over 65 and is characterised by immune cell infiltration, endothelial dysfunction, and valvular interstitial cell differentiation. These processes lead to left ventricular remodelling and altered hemodynamics, particularly elevated wall shear stress (WSS). Recent evidence suggests that such mechanical forces influence immune cell behaviour, including the formation of extracellular traps (ETs)—web-like DNA structures containing histones, proteases, and antimicrobial peptides.

Aim: To investigate whether pathological shear stress induces MET formation and to explore its interaction with inflammatory stimuli in the context of AS.

Method: Monocytes were isolated from healthy donor's peripheral blood using the Histopaque gradient method. Cells were exposed to pathological shear stress (400 dyne/cm^2) using a microfluidic model of AS developed before. In parallel, cells were stimulated with phorbol 12-myristate 13-acetate (PMA), lipopolysaccharide (LPS), and calcium ionophore A23187, both with and without shear stress, across multiple time points (3, 24, 48, and 72 hours). METs were visualised by immunofluorescence targeting DNA, histone H3, and myeloperoxidase (MPO), and quantified by positive area.

Results: Shear stress significantly enhanced MET formation, with the most robust response observed at 24 hours. Among chemical stimuli, PMA and A23187 produced the strongest MET induction, which was further amplified under shear conditions. These findings suggest that monocytes, like neutrophils, respond to mechanical stress by releasing ETs, indicating a broader role for mechanotransduction in immune cell activation.

Conclusion: This study demonstrates that pathological shear stress enhances MET formation, revealing a novel mechanosensitive response in monocytes. These findings highlight the potential role of METs in AS progression and open avenues for developing therapies that modulate immune activation in response to mechanical stress. Ongoing investigation into the signalling pathways involved may help clarify the mechanisms of MET formation and reveal potential targets to reduce inflammation and MET-associated pathology

Keywords: Shear stress, Aortic Stenosis, Hemodynamic forces, Monocytes, METs.

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Illuminating The Phospho-Proteome Landscape in Cardiac Fibroblasts During Cardiac Ischemic-Reperfusion Injury

Natasha Patel; Alin Rai; Sadegh Eslami; David Greening

Cardiac ischemic-reperfusion injury (IRI) involves early-signalling changes that drive cellular adaptations and functional defects in cardiac tissue. Cardiac fibroblasts (CFs) play a central role in the development of pathological fibrotic remodelling, impairing contractility. With limited fibrosis-targeted therapies, this highlights a need to identify early-phase molecular drivers of IRI to minimise adverse remodelling. Post-translational modifications (PTMs) such as phosphorylation are critical in signalling and cellular responses but remains largely uncharacterised during early-phase IRI.

Aim: To capture the early phosphorylation events of the CF network using mass spectrometry (MS) based profiling during IRI.

Methods: We employed an in-vitro IRI model to assess dynamic cell changes in CFs to understand early-phase IRI development (western blot, reactive oxygen species generation, collagen deposition). Human primary ventricular cardiac fibroblasts (HVCFs) were exposed to 1 hr hypoxia under nutrient-depleted conditions, and up to 18 hr reoxygenation with nutrient-rich media. Proteomic sample preparation, TiO2-based phospho-enrichment and high-sensitivity MS analysis were performed for phospho-proteomic analysis.

Results: We initially compared changes in mouse heart proteome 4hr post-IRI. This revealed significant changes in early-phase remodelling of proteome and kinase network associated with IRI. In HVCFs, our in-vitro IRI model over 30-60 min and 18 hr showed expression of HIF-1a, elevated ROS generation and collagen deposition. We quantified 6776 proteins, 1918 phosphoproteins, 5439 phosphopeptides and 7332 phospho-sites in HVCFs. Proteomic remodelling highlighted key networks of IRI response, including enrichment terms such as “cellular response to starvation”, “cellular response to hypoxia”, and temporal changes in kinase networks associated with CFs. Phosphoproteomics revealed in-depth phosphorylation landscape associated with IRI with 637 phosphopeptides significantly dysregulated (One-way ANOVA, FDR 0.001) in IRI relative to normoxia. We employed kinase enrichment analysis to identify upstream kinase regulators of these phospho-sites, revealing abundantly ranked kinase regulators Akt1 (p-value 3.79E-05, FDR 0.002), p38A (p-value 5.10E-04, FDR 0.01) and MAPKAPK2 (p-value 2.16E-03, FDR 0.03).

Conclusion: This study provides a strategy to understand early-phase phosphorylation network and kinase regulators in IRI. By integrating tissue data with changes in cellular proteome and phospho-site landscape, we reveal potential regulatory kinases that may target downstream drivers as cell-signalling interventions to limit IRI damage.

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The coronary accessible extracellular landscape in the heart following myocardial infarction

Iasmin Inocencio, Alin Rai, Daniel Donner, David W Greening

Myocardial Infarction (MI) is a leading cause of death worldwide. About 50% of MI survivors will develop heart failure due to ischaemia-reperfusion (I/R) injury. Unfortunately, delivering targeted therapeutics to treat I/R injury remains a clinical challenge. To overcome this challenge, the coronary vasculature poses a central target for therapeutic intervention in the heart, given its direct accessibility from circulation. Targeting the transformation of cell surface and interacting protein landscape in I/R injury offers an excellent molecular platform for precise therapeutic delivery and curbing off-target effects.

Aim: To identify coronary accessible extracellular landscape proteins for targeted delivery in a mouse I/R injury model.

Methods: We performed coronary artery perfusion with membrane-impermeant biotin-saline to label and capture the vasculature-accessible extracellular proteome in the intact heart. Biotin-labelled proteins were separated from whole heart tissue using tissue lysis followed by neutravidin-based purification. The same surgical, protein labelling and analytical techniques were applied in a model of I/R injury (24 hrs) in male and female mice. Proteomic profiling was performed using quantitative mass spectrometry (MS) and functional enrichment analysis.

Results: We identified 701 coronary-accessible proteins in healthy mice including cell surface receptors, adhesion, junctional molecules and extracellular domains. We annotated 216 cardiac cell-specific proteins: 29 in cardiomyocytes (CXADR, CACNA1C), 12 in cardiac fibroblasts (ITGA8, COL3A1), and 63 in multiple cell types (ICAM1, CDH2). Following 24-hour I/R injury, males showed 737 dysregulated extracellular proteins (FDR<0.05) with functional annotation for extracellular matrix organization and cell-matrix adhesion. Females showed 371 dysregulated extracellular proteins enriched for serine endopeptidase activity, cell-substrate adhesion, and complement activation.

Conclusion: This method enables detailed mapping of the coronary-accessible surface and extracellular proteome in the heart. Applied to an I/R injury model, it revealed key proteins linked to hallmark injury responses, highlighting potential molecular targets for clinical treatment of I/R-related cardiac injury.

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Adhesive Silk-Based Cardiac Patches for Localized Sustained Delivery of Cell-Derived Nanovesicles

Auriane Drack, Alin Rai, Hien A Tran, Jelena Rnjak-Kovacina, David W. Greening

Cardiovascular disease causes ~18 million deaths annually, and up to half of myocardial infarction (MI) survivors develop heart failure, largely driven by cardiac fibrosis, with current therapies failing to restore the lost heart tissue. Extracellular Vesicles (EVs), a cell-free therapy, hold tremendous promise for cardiac repair and regeneration but their low production yield and limited myocardial retention hinder their clinical translation.

Aim: To develop a biomaterial platform integrating scalable iPSC-derived nanovesicles (NVs) into adhesive silk hydrogel patches for local and sustained delivery of cell-free therapy to the heart.

Methods: NVs were generated by serial extrusion of iPSCs, which can be derived directly from patients, and encapsulated in silk fibroin hydrogels via visible light crosslinking. Release kinetics were quantified by nanoparticle tracking analysis, anti-fibrotic activity assessed in human primary cardiac fibroblasts via proteomics, adhesion tested ex vivo on murine hearts, and efficacy of the NV-loaded patch evaluated in a MI mouse model by echocardiography, histology, and proteomics at 28 days.

Results: NVs exhibited typical EV size (~115 nm) with 25-fold higher yield compared to EVs and consistent protein composition enriched in tissue repair regulators. NV incorporation into silk hydrogels resulted in tissue-adhesive cardiac patches with native-like cardiac mechanics and controlled NV release over short (2 days), intermediate (7 days), and extended (up to 28 days) periods. Sustained NV delivery in vitro promoted anti-fibrotic remodelling and modulated integrin signalling, actomyosin organization, and cell-matrix adhesion networks. Preliminary in vivo data on MI mouse model revealed reduced fibrosis and proteomic evidence of cardiomyocyte preservation, with analysis ongoing.

Conclusion: This work establishes the first adhesive silk hydrogel cardiac patch combining scalable NV production with controlled spatiotemporal delivery. By overcoming key barriers limiting EV therapeutics, this platform provides a mechanistically informed and translationally relevant strategy for post-MI myocardial repair.

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LV and LA Fibrosis in AF with LV Dysfunction: Dual-Chamber Substrate Shapes Remodelling After Ablation

Louise Segan, Peter M Kistler, Kenneth Cho, Shane Nanayakkara, Andrew Taylor, David M Kaye, James L Hare, Benedict Costello, Hitesh Patel, David Chieng, Rose Crowley, Jeremy William, Hariharan Sugumar, Aleksandr Voskoboinik, Liang-Han Ling, Joseph B Morton, Geoffrey Lee, James Theuerle, Michael Wong, Jonathan M Kalman, Sandeep Prabhu

In atrial fibrillation (AF) with left ventricular systolic dysfunction (LVSD), catheter ablation (CA) improves cardiac remodelling and outcomes, but the impact of left ventricular (LV) fibrosis on atrial substrate and post-ablation recovery is uncertain.

Methods: Patients with AF and LVSD (LVEF ≤45%) from the CAMERA-MRI and CAMERA-MRI II randomized trials with electro anatomical mapping were analysed. Pre-procedural cardiac magnetic resonance (CMR) quantified LV late gadolinium enhancement (LGE; positive if ≥5%) and native T1. High-density LA mapping in sinus rhythm measured global/regional bipolar voltage, low-voltage area (LVA <0.5 mV), scar (<0.05 mV) and fractionation. Primary analyses compared LA remodelling by LGE status. Secondary analyses assessed arrhythmia recurrence, AF burden and LVEF normalization at 12 months.

Results: Sixty-four patients (mean age 60±13 years; LVEF 32±8%) were included; 32 (50%) were LGE-positive. Baseline LVEF and LA size were similar between groups. LGE positive patients exhibited more advanced LA remodelling with lower global voltage (0.86 ± 0.41 vs 1.33 ± 0.45 mV, p<0.001), more LVA and scar and more extensive posterior wall involvement (all p<0.05). Native T1 was higher with LGE (1230 [1170,1378] vs 1139 [1084,1242]ms, p=0.033).
At 12 months, arrhythmia recurrence was similar (50% vs 38% in LGE negative, p=0.314), but LVEF normalization was less frequent in LGE-positive patients (66% vs 88%,p=0.039). Presence of LA further reduced LVEF normalization (48% vs 90%,p<0.001), driven by higher LV LGE burden (9.2% vs 0.1%,p<0.001) and among those with recurrence, was linked to higher AF burden (20% [7-28.5] vs 3% [0.6-9.3],p=0.027).

Conclusion: In AF with LVSD, LV fibrosis is strongly linked to advanced atrial substrate and attenuated reverse remodelling after AF ablation. LA scar also predicts impaired recovery, largely reflecting coexistent LV fibrosis. CA remains beneficial but the presence of LV scar identifies a broader myocardial disease phenotype and should refine expectations of post-ablation outcomes.

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Exploring the Cardiac Nuclear Proteome Reveals Heart Anatomical Region-Specific Nuclear Landscape

Sadegh Eslami, Alin Rai, David W Greening

Background: The nucleus is a central niche in orchestrating cell function. The heart is a highly organized organ whose function depends on the localization of proteins in specific subcellular regions, including the nucleus.
Transcription factors (TFs) low-abundance master regulators of gene expression, orchestrate central regulatory processes of cells and tissues, rely on their localization. Stress or injury to the heart alters nuclear proteome and the TF network, driving changes in adverse remodelling. However, enriching and characterizing the nuclear proteome of the heart remains challenging due to its structural and cellular complexity and limitations in mass-spectrometry sensitivity.

Aim: To define the nuclear landscape of the mouse heart and understand TF heterogeneity across anatomical regions.

Methods: Nuclear enrichment and advanced mass-spectrometry proteomics (Orbitrap) were performed on atrial and ventricular regions (left/right) of C57BL/6 mouse hearts (n = 4). The optimized nuclear workflow was compared related to global and regional heart proteomes, followed by detailed informatic analyses and validation of protein abundance and localization using immunofluorescence.

Results: This high-resolution strategy, combining nuclear enrichment with mass spectrometry, identified over 7,000 proteins in the heart, including more than 3,000 nuclear proteins. It resolved nuclear features such as chromatin-associated networks and provided detailed coverage of low-abundance TFs (e.g., Fos, Gatad2, Mef2). Distinct nuclear proteome landscapes were observed across heart regions, including conserved nuclear proteins throughout the mouse heart. Region-specific findings included elevated SUN2 and H2A in the left atrium and PTBP2 in the left ventricle, with nuclear localization validated by immunofluorescence. TFs were mapped to functional compartments, revealing a spatial regulatory framework.

Conclusion: Optimized nuclear enrichment expands the cardiac nuclear proteome and TF network, offering new insights into spatial mapping and organizing of the mouse heart. This subcellular proteomics approach provides applications for understanding transcriptional regulation at pathophysiological conditions, and potential therapeutic targets in heart disease.

Baker Heart & Diabetes Institute Prize for Diabetes Research

Complement C5ar2 Deletion Modulates Gut Barrier and Morphology in a Mouse Model of Type 1 Diabetes

Khayyira AS, Trambas IA, Sharma A, Snelson M, Laskowski A, Tan SM, Coughlan MT

We have previously shown that the complement C5a–C5aR1 axis mediates gut permeability in diabetes. However, C5a also signals via C5aR2, whose role in intestinal barrier regulation is unclear.

Aim: To investigate the role of C5aR2 in gastrointestinal permeability and tight junction proteins in a mouse model of type 1 diabetes.

Methods: C5aR2 knockout (KO) and wild-type (WT) C57BL/6 mice were rendered diabetic with streptozotocin (STZ) and followed for 10 and 20 weeks. Assessments included metabolic parameters, intestinal morphology, plasma lipopolysaccharide-binding protein (LBP, as a marker of permeability), colonic tight junction gene expression (qPCR), and faecal microbiome profiling (16S rRNA sequencing).

Results: Diabetic mice showed hyperglycaemia ($P<0.0001$) and albuminuria ($P<0.0001$) regardless of genotype. Diabetes increased whole gastrointestinal tract and caecum size ($P<0.0001$), but not colon dimensions. Colon weight was reduced in diabetic KO mice at 10 weeks ($P=0.0155$), with no difference at 20 weeks. Plasma LBP was unchanged by diabetes or genotype, though a non-significant decrease was observed in KO mice at 20 weeks ($P=0.0828$). Diabetes increased colonic occludin expression ($P=0.0345$), which was further elevated in KO mice at 10 weeks ($P=0.0352$). At 20 weeks, diabetes upregulated occludin and claudins-1, -2, -3, -4, -5, and -7, while claudin-3 and -4 were significantly reduced in KO mice ($P=0.0161$, 0.0014). Microbiome analysis revealed diabetes-induced beta diversity shifts ($P=0.001$) at both timepoints and reduced alpha diversity at 20 weeks ($P=0.0211$). Diabetic KO mice displayed a higher Firmicutes/Bacteroidetes ratio than WT ($P=0.0057$).

Conclusion: C5aR2 deletion alters colonic tight junction gene expression and the gut microbiome in diabetes. While functional effects on permeability remain unclear, these findings suggest a novel role for C5aR2 in regulating intestinal barrier integrity.

Baker Heart & Diabetes Institute Prize for Diabetes Research

The Impact of Ethnicity and Its Definition on Diabetes Prevalence: A National Australian Whole-Of-Population Study

Joanna Y Gong, Agus Salim, Spiros Fourlanos, Dianna J Magliano, Jonathan E Shaw

Background/Aims: Understanding how to best categorise and conceptualise ethnicity is integral to developing effective diabetes health policies and interventions. It is also important for conducting meaningful research in multicultural communities. We aimed to determine the extent to which using large geographic regions to group ethnicities (ancestries or countries-of-birth) masked intra-regional variation in diabetes risk.

Methods: We performed a cross-sectional analysis of the 2021 Australian Census, the first time that self-reported health data were collected. Ethnicity-specific diabetes prevalence was age and sex-standardised to a reference population of all adult Census respondents.

Results: Among more than 17.7 million adults, there was a two- to four-fold intra-regional variation in diabetes risk. Diabetes prevalence among East Asian people reporting a single ancestry ranged from less than the Australian prevalence (Japanese 4.1%, Thai 5.8%) to almost twice the Australian prevalence (Filipino 12.0%). For South and Central Asia, among those reporting a single ancestry, diabetes prevalence ranged from 7.2% (Armenian) to 18.7% (Bangladeshi). People reporting single Middle Eastern and North African ancestries had diabetes prevalence values ranging from 5.5% (Jewish) to 12.0% (Egyptian and Iraqi). In Oceania, the diabetes prevalence in people of Australian Aboriginal, Fijian, Maori, Samoan and Tongan ancestry was much greater than the prevalence among people reporting Australian ancestry alone (17.0%, 12.1%, 9.8%, 15.7% and 16.9%, respectively versus 6.1%).

Conclusions: Grouping ethnicities by region masks two- to four-fold intra-regional variability in diabetes prevalence. Where ethnicity can be broken down into specific ancestries and countries-of-birth, this should be done in preference to grouping by broad geographical region. This study also provides prevalence estimates for minority ethnicities, alerting us to high-risk groups in which to intervene early. Improving our understanding of diabetes among minority ethnicity populations could significantly improve the quality of diabetes studies and interventions in our increasingly ethnically diverse world.

Baker Heart & Diabetes Institute Prize for Diabetes Research

Bioenergetic Profiling of Living Human Kidney Donors Reveals Distinct Kidney Mitochondrial Metabolic and Morphological Alterations in Diabetes

Cesare Granata, Adrienne Laskowski, Runa S.J. Lindblom, Vicki Thallas-Bonke, Georg Ramm, Richard J. MacIsaac, Peter Royce, Christopher Chang, Nicholas Campbell, Jeremy Grummet, Mark E. Cooper, Catriona A. McLean, Elif I. Ekinci, Scott G. Wilson, Melinda T. Coughlan

Poor access to freshly obtained human kidney is a key limitation in the study of early diabetic kidney disease (DKD), the most common cause of kidney failure worldwide. Impaired mitochondrial function in the kidney in diabetes has been widely established and is largely thought to precipitate a decline in kidney function; however, altered mitochondrial respiration in the kidney has been only demonstrated in animal models.

Aim: The aim of this study was to determine mitochondrial metabolic rate by high-resolution respirometry in the kidney of individuals with diabetes.

Methods: Renal cortex from human kidney biospecimens, obtained from the macroscopically/microscopically healthy portion of tumor nephrectomies was harvested from living donors with diabetes and normal kidney function compared to age- and sex-matched, histopathologically normal, donor controls. Oxygen consumption rates were determined with a substrate-uncoupler-inhibitor titration protocol by high resolution respirometry (Oxygraph-2k respirometer, Oroboros Instruments) in saponin-permeabilized tissue. In addition, respiration rates were also measured for a subset of specimens (n=12 ND, n=9 D) in mitochondria isolated by differential centrifugation.

Results: Renal cortices were freshly collected from non-diabetic controls (ND, n=15), and patients with diabetes (D, n=12). We report enhanced mitochondrial respiration in situ in live permeabilized kidney cortex in diabetes. Imaging analysis of tubular cells, the most metabolically active and predominant cell type in the kidney, showed features of altered mitochondrial behavior with an increase in mitochondrial volume density and fragmentation. However, mitochondrial respiration assessed in isolated mitochondria decreased in diabetes and complex activity of the electron transport system was suppressed.

Conclusion: Our findings demonstrate for the first time that patients with diabetes display a profile of altered renal mitochondrial respiratory control. This work provides insights into the early metabolic changes present in the human kidney in diabetes prior to a measurable decline in kidney function, providing key clues to DKD pathogenesis.

Allied Health Research

Repeatable Battery for the Assessment of Neuropsychological Status (RBANS): Preliminary Utility for Subacute Cognitive Monitoring After Immune Effector Cell-Associated Neurotoxicity Syndrome After Chimeric Antigen Receptor T-Cell Therapy

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Aim: Chimeric antigen receptor T-cell (CAR-T) therapy has led to durable responses in many patients with relapsed/refractory haematological malignancies, and emerging research demonstrates that it may also be promising for the treatment for neuroimmunological conditions. However, CAR-T therapy is associated with potentially life-threatening complications, including immune effector cell-associated neurotoxicity syndrome (ICANS). Cognitive dysfunction is a common manifestation of ICANS, but cognitive recovery has yet to be well characterised. This study examined the Repeatable Battery of the Assessment of Neuropsychological Status (RBANS) as a tool for monitoring subacute cognitive recovery.

Methods: In this prospective, single-centre cohort study, patients undergoing CAR T-cell therapy at The Alfred Hospital in Melbourne were evaluated with the RBANS at Day+1, Day+7, and a subacute outpatient visit (median 45 days post-infusion, IQR: 38 – 52).

Results: 238 RBANS administrations were conducted on eighty-seven patients (63% male, mean age of 66.2 years at infusion). Thirty (34%) patients developed ICANS. General linear mixed-effects models found significant time by ICANS group interactions. Post-hoc comparisons revealed that the ICANS group demonstrated significantly worse Attention, Language, and Total Index scores at Day+7, and significantly worse Total Index score at subacute review compared to the no ICANS group. Supplementary analyses also demonstrated that the higher grade (Grades 3 and 4) ICANS group performed worse than low-grade (Grades 1 and 2) and no ICANS groups.

Conclusion: Patients who developed ICANS demonstrated deficits in attention and language. These cognitive deficits may persist for more than 45 days post-infusion in some patients. The RBANS shows potential as a valid measure of ICANS-related cognitive dysfunction, which can be used at the bedside and in clinic, as well as in research settings. This can inform clinical decision-making and follow-up care, and guide future research aimed at improving neurocognitive outcomes in CAR-T recipients.

Allied Health Research

The revised risk assessment and prediction tool to predict discharge home following joint arthroplasty

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Background: The Risk Assessment and Prediction tool (RAPT) is validated to predict the need for inpatient rehabilitation following total joint arthroplasty (TJA). With current practice and shorter hospital length of stay (LOS), a revised tool was created to improve the accuracy of predicting discharge within 3 days of surgery.

Methods: All total knee (TKA) and hip (THA) arthroplasty patients within Alfred Health between November 2022 and March 2024 were included. Data was collected including the original RAPT and American Society of Anaesthesiologist (ASA) scores. An algorithm based on surgery type, age, joint, RAPT and ASA score was applied to predict LOS (revised RAPT; reRAPT). Demographic and clinical data including actual LOS (classified as ≤3 days, 4-6 days or ≥7 days) and discharge destination, were analysed to determine the sensitivity and specificity of the reRAPT.

Results: Of 394 patients (age mean 69 [SD 10] years, 228 [58%] female), 162 (41%) had an ASA score ≥3 and 205 (52%) underwent TKR. 176 (45%) patients stayed ≤3 days and 350 (89%) were discharged home. The original RAPT tool demonstrated a sensitivity of 58% (102/176) and specificity of 71% (154/218) to predict ≤3 days LOS. Sensitivity was improved using the reRAPT (73%, 129/176). Specificity did not improve using the revised tool (58%, 126/218).

Discussion/Conclusion: Aligned with clinical practice aiming to reduce LOS, the reRAPT improved sensitivity to predict LOS ≤3 days post TJA compared to the original RAPT. This can help clinicians allocate resources and facilitate discharge planning.

Allied Health Research

Developing an Optimal Treatment for Dysfunctional Breathing in Adults: An International Delphi Study

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Dysfunctional breathing (DB) results in respiratory and non-respiratory symptoms and impairs quality of life. Our recent systematic review identified five groups of non-pharmacological interventions for DB which were not well described.

Aim: This study aimed to gain consensus regarding the critical components, optimal format and delivery methods of non-pharmacological DB interventions.

Methods: A two-round Delphi process was conducted involving international experts, with each round followed by a consumer focus group. Online surveys were distributed using the Qualtrics survey platform. A 5-point Likert scale was used for rating the importance of each component with 1 'strongly disagree' to 5 'strongly agree' as anchors. Components were defined as essential (median ≥4, interquartile range [IQR] =0), desirable (median = 5, IQR >0) or optional (median = 4, IQR >0). In the 2nd round, components with median score ≤3 and IQR = 0 were eliminated, and components without consensus (IQR>0) were rescored.

Results: Participants included 46 experts and 5 consumer group patients with DB in Round 1, and 44 experts and 4 consumers in Round 2. Essential components for treating DB were breathing retraining ± biofeedback, education (median 5 [IQR 0]), manual therapy, and psychological therapy (4 [0]). Respondents emphasised the need for components to be individualised. Optional components were exercise training for fitness and exercise with breathing retraining (4 [1]). Acupoint therapy was considered non-essential (2 [1]). Essential components for treatment format were assessment and home practice (5 [0]). Desirable components were reassessment, and individualised education (5 [1]). Individualised modes of delivery were an optional component (4 [1]).

Conclusion: This study identified five essential components for treating DB, with assessment and home practice essential for intervention delivery. Individualisation of interventions and treatment format are recommended. The findings provide a basis for the development of treatment options for people with DB.

Allied Health Research

The Effectiveness and Feasibility of the Implementation of a Non-Weight Bearing (NWB) Coordinator Within Alfred Health – A Scoping Review

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Background: Emerging evidence suggests that early weight bearing is safe and effective in elderly patients, although in practice non-weight bearing (NWB) orders are often made. The aim of this project was to determine effectiveness and feasibility of introducing a NWB coordinator within Alfred Health.

Methods: Patients admitted under General Medicine between June and December 2023 with a fracture were reviewed retrospectively. Following this, a four-week prospective audit was undertaken by a senior orthopaedic physiotherapist of all patients with a fracture managed under a non-orthopaedic/trauma bed-card. Patients considered appropriate for an alteration of WB status were discussed with a consultant surgeon. The number of changes to WB status and the patient's short-term outcomes was reviewed.

Results: 140 patients in a 6-month period were admitted under General Medicine with a fracture, with a median (IQR) LOS of 6 (3-10) days and only half were discharged home, including those with isolated upper limb fractures (21/43 discharged home). 88 patients were admitted with fractures under non-orthopaedic/trauma units in a Feb/March 2024 (4-week period). A senior orthopaedic physiotherapist facilitated a progression of orthopaedic care for 13 patients. Potential savings per patient ranged from 18 to 56 subacute/transitional care bed-days, with a conservatively estimated accumulative total of 261 bed-days

Conclusion: Introducing a NWB coordinator may increase bed capacity by modifying the orders of some NWB patients. This role may improve access to best care throughout the hospital journey for all patients admitted with a fracture regardless of bed-card.

Allied Health Research

Evaluation of Patient Outcomes Following Implementation of an Alternative, Community-Based Model of Care for Complex High Risk Foot Patients During the Covid-19 Pandemic

Liz Perry, Julia Gilmartin-Thomas, Shan Bergin, Eldho Paul, Naomi Rowlings, Carly Bertram, Nalini Natesan

Extreme pressure on acute healthcare settings during the Covid-19 pandemic resulted in the rapid implementation of alternative service models for many patient groups. In 2020, complex high risk foot patients attending podiatry outpatient services at Alfred Health were transferred to community-based services to alleviate pressures on acute services and to reduce the risk of infection spread. Patients were categorised using the triage tool developed by DFA into highly serious, serious and stable groups.

Aim: This study aimed to evaluate the impact of this transition on patient outcomes and identify opportunities to further evaluate the best model of care for these at-risk patient groups.

Methods: A retrospective audit of electronic medical records was conducted for all patients transferred from acute to community-based care for the period April 2020 – July 2020. Pre-determined data was collected for the 6-month period pre and post transfer. Demographic data including age, gender and language spoken was collected alongside clinical data such as peripheral arterial disease, renal status, foot ulcer and amputation history. Outcome data such as emergency department presentations, amputations and deaths were also collected. A comparison of highly serious and serious patients was analysed to determine how outcomes compared for these categories.

Results: Preliminary results indicate of the 57 patients who were transferred 93% had diabetes, 11% had end stage renal failure, and 60% had peripheral arterial disease. 9% had an acute Charcot foot and 47% had foot ulcers at time of transfer.

There were significant differences between highly serious and serious patient groups in most outcomes.

Conclusions: Results from this study can support the need for ongoing intensive hospital-based care for the highly serious category while those in the serious and stable groups would be safe accessing shared care models with community-based podiatry services.

Allied Health Research

ICU Speech Pathology Staffing and Post-ICU Length Of Stay

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Introduction: The role of Speech Pathology (SP) in the Intensive Care Unit (ICU) is well-recognised in improving patient communication and swallowing outcomes. To date, research has not explored the relationship between the presence of ICU-dedicated SP services and overall patient outcomes.

Objectives: To determine whether the amount of ICU-dedicated SP staffing was related to length of stay (LOS) in hospital after ICU discharge for survivors who received invasive ventilation.

Methods: A retrospective cohort study drawing on ANZICS Registry data cross-linking Adult Patient Database and Critical Care Resources datasets. Patients who had received invasive ventilation and been discharged from ICU to a ward between July 2013 and June 2023 were included. Descriptive statistics and multivariable log-linear regression were used to investigate the relationship between post-ICU LOS (outcome) and the amount of annual full-time equivalent SP per 1000 patient-days (aFTE/1000) employed in each ICU.

Results: 191 ICUs and 421,897 patients met inclusion criteria. 122 (64%) ICUs reported a dedicated SP service for at least one year with a median FTE 0.20 (IQR 0.10-0.50) per site per year and median annual FTE 0.070 (IQR 0.046-0.123) per 1000 patient days per site. 237,832 (56.4%) patients had been in ICUs with an ICU-dedicated SP service. These patients were in larger public metropolitan and tertiary ICUs, had higher illness severity scores and longer duration of ventilation. They had a small but statistically significant longer LOS in hospital after ICU discharge (median 5.9 (IQR: 3.5-11.1) vs. 5.8 (IQR: 3.8-10.2) days $p<0.001$). However, after adjusting for confounders, there was an association between LOS and employment levels, with every unit increase in aFTE/1000 equating to a 41% decrease in post-ICU LOS (β -0.41, [95%CI: -0.66 to-0.17], $p<0.001$).

Conclusion: ICU-dedicated SP services are associated with shorter LOS in hospital after ICU discharge. Further research is required to determine the factors influencing this.

Allied Health Research

A Price Check on Ketogenic Diet Therapy for Epilepsy

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Background: The ketogenic diet is an effective treatment option for drug-resistant epilepsy, but its perceived high cost may be a barrier to use.

Aims: To compare the weekly costs of ketogenic diets with the costs of the Australian dietary guidelines and a typical Australian diet.

Methods: Weekly meal plans were created for a reference male and female, aged 31-50 years, for five diets: classical ketogenic, modified ketogenic, specialty modified ketogenic, Australian dietary guidelines, and a typical Australian diet obtained from census data. Cost was obtained from the average prices from three major supermarkets.

Results: For females, the classical ketogenic diet ($70.00AUD) was the cheapest followed by the typical Australian diet, specialty modified ketogenic diet, modified ketogenic diet, and the Australian dietary guidelines ($99.23AUD). For males, the typical Australian diet ($82.96AUD) was cheapest followed by the classical ketogenic diet, Australian dietary guidelines, specialty modified ketogenic diet, and the modified ketogenic diet ($119.61AUD).

Following a specialty modified ketogenic diet, modified ketogenic diet or Australian dietary guidelines increased food costs by 0.6-4 percentage points for females and 1.4-6.6 percentage points for males, representing a 9.0-31% and 14-44% increase in spending for females and males respectively when compared to current spending for the typical Australian diet.

Conclusion: Our study demonstrates that following the dietary guidelines or a modified ketogenic diet is more expensive than the typical Australian diet, potentially increasing the financial burden and risk of food insecurity for people with epilepsy. A diet subsidy, similar to those available for people with inborn errors of metabolism, could help reduce barriers to dietary therapy for epilepsy.

Allied Health Research

Assessment of Nursing Staff's Knowledge of Meal Packs in a Bed Substitution Model; Pre- and Post Education Intervention

Amanda Adell, Maria O'Sullivan, Suzannah Jackson, Andrea Bramley

Background: The Better at Home (BAH) program is a bed substitution model at The Alfred Hospital; this service provides meal packs for those at risk of food insecurity. A previous pilot study demonstrated concerns with adherence to the meal pack process guideline, resulting in patients receiving inappropriate meal options

Aim: determine and improve nursing knowledge of organising meal pack provision.

Methods: BAH nursing staff survey results were compared pre- and post- education intervention on the meal packs process (ordering and delivering) using Microsoft forms. Statistical analysis was conducted using Excel (Version 2505).

Results: The education was attended by 10 participants and a total of n=11 (pre-education) and n=6 (post-education) responses collected. Survey responders were not matched. All nurses (100%) checked patients access to re-heating appliances, ordered meals correctly via the menu monitor and followed the correct transport protocol for meal packs. However, the education provided helped improve nursing awareness on the importance of checking diet codes and allergens/intolerances: 82% (pre-education) vs 100% (post-education). Education also helped improved awareness of the importance of offering a meal choice: 45% (pre-education) vs 83% (post-education).

Conclusion: BAH meal packs are an essential resource for those experiencing food insecurity once discharged from hospital. Education significantly enhanced nursing knowledge on providing safe, appropriate meals tailored to individual nutritional needs and preferences, which could improve patient satisfaction.

Allied Health Research

Improving weekly weight adherence in an acute trauma ward: A dietetic - led multidisciplinary approach

Claire Walsh, Katherine Muller, Tahlia Farragher, Lauren Balcombe, Juan Gultiano, Sara Calthorpe, Dr. Lara Kimmel

Background: Regular weighing of patients is a critical hospital key performance indicator (KPI) for identifying nutritional risks, medication dosing, and assessing nutrition interventions. However, maintaining consistent weekly weighing on wards is challenging.

Method: Baseline data was collected in August 2024 to determine percentage of patients who had weekly weight collected on a trauma ward at The Alfred, Melbourne. A multidisciplinary team, consisting of senior nursing staff, a physiotherapist, and a dietitian, was formed to conduct weekly "weigh rounds" on this ward and data was collected. The process involved: 1) dietitian screening patients to determine weight recorded in the past week, 2) discussing barriers with the bedside nurse, and 3) collaborating to find solutions. Data on barriers, equipment needs and recorded weights were collected. Pre- and post-intervention audits were conducted on trauma patients outside the specialized ward for comparison.

Results: Baseline data showed that 46% of patients had weekly weights recorded. A survey of nursing staff (n=24) identified barriers to weekly weighing, including competing priorities (40%), time constraints (28%), and lack of proper weighing equipment (16%). After 15 weigh rounds, weekly weight completion increased to 72%. An additional 7 patients were weighed within 24 hours, bringing the completion rate to 89.5%. For trauma patients outside the specialized ward, the completion rate remained low at 42%.

Conclusion: A dietetic-led multidisciplinary weigh round almost doubled the weekly weight completion on a specialised trauma ward from 46% to 89.5%. Further research will explore the impact of this intervention on malnutrition and other hospital-acquired complications.

Allied Health Research

Validation of the gas-sensing capsule in defining regional colonic fermentation in healthy adults

Melton SL, Gibson PR, Halmos EP

Background/Aim: Deficient carbohydrate fermentation in the distal colon promotes carcinogenesis and mucosal inflammation. However, direct quantification of regional fermentation in humans has not been possible. We hypothesised that the ingestible gas-sensing ('Atmo') capsule will do this telemetrically via measuring luminal concentrations of H_2 (carbohydrate fermentation) and CO_2/CH_4 (overall fermentation), and transit along the colon. We aimed to validate capsule findings by comparing outcomes in healthy adults under conditions predicted to alter carbohydrate fermentation, through varying fibre intake.

Methods: 20 participants (age 33 [range 21-49] y, 10 female) were evaluated on their habitual diet and during the third week of exclusive enteral nutrition (EEN) without (n=10) or with fibre (22 g/d) (n=10). Colonic transit times (CTT) and luminal gas (H_2, CO_2/CH_4) concentrations were measured by the capsule. Faecal short-chain (SCFA) and branched-chain fatty acids (BCFA) were measured to confirm anticipated effects of the model.

Results: Faecal SCFA were reduced (p=0.01) and BCFA increased (p=0.02) with no-fibre, not fibre-EEN, compared with habitual diet as anticipated. Despite no differences in stool frequency or consistency across the 3 dietary periods, CTT on no-fiber EEN was >twice that with habitual diet (p=0.01), with no differences between fibre-EEN and habitual diet. Median colonic H_2 concentrations were 11.2 [0.4-20.9]% with fibre-EEN vs 0.2 [0-7]%; no-fibre-EEN (p<0.001). The increasing proximal-distal H_2 gradient on habitual diet (3.2 [0-10.1] to 7.1 [0-13]%.h) was reversed with no-fibre-EEN (1.7 [0-2.5] to 0 [0-1.3]%.h) but not with fibre-EEN (6.5 [0.7-12.6] to 10.6 [0.6-20.6]%.h). CO_2/CH_4 concentrations were not different throughout the colon with the 3 diets, but distal H_2:CO_2 ratio was increased with no fibre- compared with fibre-EEN (p=0.005).

Conclusions: The gas-sensing capsule directly quantified colonic transit, and regional carbohydrate and overall fermentation associated with variations of fibre intake, validating its ability of provide unique insight into colonic physiology.

Allied Health Research

Can early intervention for patients with frailty in a trauma ward reduce delirium rates?

Kimmel L, Webb M, Glascott J, Muller K, Balcombe L & Lodge M

Introduction: Frailty in the trauma patient population is associated with elongated length of stay and poorer progression within the hospital setting. It is also associated with increased hospital acquired complications including delirium. The aim of this study was to determine if early and intensive therapy in the acute hospital for patients with frailty is associated with a reduction in delirium.

Methods: Data were collected on all patients with frailty admitted to the trauma ward at The Alfred in Melbourne from June 2023 until Nov 30, 2024. From April 1, 2024, all patients with frailty were targeted to receive early intervention by the Allied Health team, including interventions for physical and psychological well-being. The occasions of service and time spent with patients were compared with the main outcome being rates of delirium for patients pre and post intervention.

Results: There were 284 patients in the pre intervention group and 249 in the intervention group. There was a significant increase in the median occasions of service [13 (7, 22); 17 (9, 28) $p<0.001$] and median time spent [8.2(4.1, 14) hrs; 10.9 (6, 17.5) hrs $p<0.001$] with the patients in the intervention time period compared to baseline. The rate of delirium in the baseline period was 18.3 % which reduced to 16.4% following introduction of the targeted therapy.

Conclusion: Preliminary results show that the introduction of targeted early, multidisciplinary intervention for patients with frailty in the acute hospital can lead to a reduction in rates of in-hospital delirium.

Allied Health Research

Cortical stimulation predicts language decline following SEEG radiofrequency thermocoagulation

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Aim: To examine whether language assessment during SEEG cortical stimulation can identify nodes within the network that are essential to support function, by examining outcomes associated with radiofrequency thermocoagulation (RFTHC) to language-positive sites.

Methods: Thirty-six consecutive SEEG patients with drug resistant focal epilepsy were prospectively recruited. Language assessment was undertaken before and 3-months after RFTHC (M=106.92days, SD=27.83), which included the Boston Naming Test, Auditory Naming Test, and semantic fluency task. During high frequency (50hz) cortical stimulation, language was assessed in vivo using visual and auditory naming, reading, spontaneous speech, and/or counting tasks. Reliable change indices were calculated to classify language decline. Group comparisons were performed using independent samples t-tests or Chi-squared tests.

Results: Of the 36 patients (M=36.19, SD=9.22 years, range=17–56 years, 56% female), 14(39%) had a language dominant epileptogenic zone, 18(50%) a nondominant epileptogenic zone, and 4(11%) a bilateral epileptogenic zone. A mean of 12.28 (SD=6.84, range=2-29) coagulation sites were undertaken per patient. Language decline was associated with RFTHC of a language-positive site (x_1^2=6.94, p=0.008, moderate effect size OR=10.00, 95%CI [1.68, 59.31]); specifically, 63% (5/8) of patients with RFTHC of a language-positive site experienced a language decline, compared to only 11% (3/28) who declined following RFTHC of language-negative sites. The likelihood of language decline was increased by 10-fold when RFTHC included a language positive site/s. By contrast, decline was not associated with age at RFTHC, age at epilepsy diagnosis, premorbid intellectual function, number of coagulation sites, or dominant hemisphere RFTHC.

Conclusion: Small nodes within language networks can be essential to support function. Moreover, the 'functional adequacy' of cognitive networks might determine the capacity to effectively compensate for RFTHC of language-positive sites. These findings reveal new intricacies to cognitive network organisation in epilepsy and highlight the clinical advantages of language mapping for identifying patients at risk of decline.

Allied Health Research

Pilot nursing and allied health lead clinic in IBD: a new model of care

Jessica Fitzpatrick

Waitlists for gastroenterologist appointments in Inflammatory Bowel Disease (IBD) clinic is increasing, and patients have inadequate access to allied health and nursing services.

Aim: To increase the efficiency of the IBD clinic by increasing access to nursing and allied health staff, while also allowing more timely treatment of patients.

Methods: A pilot Nursing and Allied Health Lead IBD clinic (NAHLS) was developed to run in parallel with the IBD service (Figure 1). NAHLS employed 1.0EFT administrator, 0.3EFT dietitian, 0.2EFT biologics nurse and 0.3EFT IBD nurse. Data collected were number of new /review appointments, and waitlist times for priority 1 and 2 referrals (P1, P2). Data was compared to the same time frame 12 months prior. National Weighted Activity Unit (NWAU) activity was calculated and compared to staff salary costs.

Results: Between Nov 2023 – May 2024 NAHLS activity for referrals/appointments were: IBD nurse - 332 new /209 review; biologics nurse - 87 new/ 13 reviews; IBD dietitian - 64 new/ 101 reviews. Gastroenterologist appointments increased to 123 new (8% total) and 1387 review compared with 110 new (7.5% total) and 1353 review pre-NAHLS (p=0.53). P1 seen on target (within 30 days) increased to 66.2% (49/74) from 36.8% (35/95) (p=0.0002). Median time to first medical appointment reduced from 40 days (P1) and 79 days (P2) pre NAHLs, to 24 days (P1) and 53 days (P2). NWAU activity from the IBD nurse was $162, 375, biologics nurse $30,014, and IBD dietitian $49, 523 (total $241, 912). Cost of salaries for the pilot were $94,411.

Conclusion: Nursing and allied health lead clinics that run in parallel to medical IBD models of care can substantially reduce waiting times for medical appointments. Health economic assessment needs to occur, however this model suggests a financially sustainable approach to providing best practice multidisciplinary IBD management in tertiary care.

Allied Health Research

Identifying Modifiable Injury-Related Factors Associated with Mobility Recovery Following Moderate to Severe Traumatic Brain Injury: Factor Generation

Ray Lobo, Simon Mills, Cassie McDonald, Natalie A. Fini & Gavin Williams

Background & Aim: Mobility recovery is an important goal for individuals who are unable to walk post Traumatic Brain Injury, and it is closely linked with overall health-related quality of life. The modifiable injury-related factors that can influence mobility recovery (i.e., spasticity or weakness) following moderate to severe Traumatic Brain Injury (msTBI) are unclear. Identifying specific factors associated with walking recovery which may be amenable to targeted therapy may assist with refining rehabilitation approaches in individuals who are unable to walk after injury. This study aims to identify the key modifiable injury-related factors which influence mobility recovery in the first 6-12 months following msTBI.

Methods: An international group of 26 experienced healthcare professionals were asked to identify modifiable injury-related factors which influence mobility recovery in adults. An iterative item generation process was utilised which included Nominal Group Technique (NGT) principles for factor generation and a Modified Delphi process for voting and ranking of critically important factors.

Results: Forty-three modifiable injury-related factors were identified following the NGT meetings. The subsequent Delphi process rated 21 modifiable factors as 'critically important' including arousal, weakness, contracture and head control. A further 21 factors were rated 'important' in influencing mobility recovery following msTBI.

Conclusion: The study highlights the breadth of potentially modifiable factors that may be crucial for mobility recovery post msTBI. Experienced clinicians identified and prioritised 21 critically important modifiable factors which may influence mobility recovery in the first 6-12 months post injury. Future research examining the relationship between these factors and mobility recovery may strengthen the evidence base, providing a foundation for developing rehabilitation strategies aimed at improving mobility outcomes following msTBI.

Allied Health Research

Comparing occupational therapy interventions for in-hospital and in-home stroke rehabiliation: a retrospective audit

Sia Horrobin, Natasha A Lannin, Emma Schneider, Jacqueline Wheatcroft, Brittni Nielsen, Karen Roberts, Laura Jolliffe

Background: In-home rehabilitation models are now common across Australia. Given the specialised nature of stroke rehabilitation, further investigation into the delivery of therapy in this model is essential for evidence-based practice in occupational therapy. This will aid clinical decision-making, optimise resource allocation, and prioritise patient-centred care and sustainability.

Aim: To compare occupational therapy interventions for activities of daily living between in-hospital and in-home rehabilitation and to explore the type, frequency and location of the intervention provided, as well as the provision of self-practice tasks in a major tertiary hospital in Melbourne, Victoria.

Method: Retrospective file audit of in-hospital and in-home rehabilitation; cases were identified during the Stroke Foundation Rehabilitation audit (01/01/2023-31/12/2023). The audit checklist was developed using the Occupational Therapy Taxonomy of Rehabilitation Interventions and the Functional Autonomy Measurement System. Descriptive statistics summarised details of therapy provided. Outcome measures included discharge destination and Functional Independence Measure (FIM) scores.

Results: Sixty-three files (n=29 in-home; n=34 in-hospital) were audited and activities were classified as education, collaboration, preparatory and occupation-based. Each activity was coded for targeted skills and therapist actions. In-hospital rehabilitation demonstrated greater FIM score improvements in both motor (mean improvement 20.85, 95% CI 14.21 to 27.50) and cognitive (mean improvement 3.41, 95% CI 1.19 to 5.63) compared to in-home rehabilitation motor (mean improvement 9.62, 95% CI 4.28 to 14.96) and cognitive (1.52, 95% CI -0.78 to 3.82). Intensity of occupational therapy rehabilitation was greater in the in-hospital rehabilitation setting. However, in-home rehabilitation offered more location-specific interventions integrated into daily routines.

Conclusion: In-hospital rehabilitation provided higher intensity and greater functional gains, while the in-home program provided better contextual rehabilitation in patients' daily environments. Findings may support clinical decision making when considering individual needs for rehabilitation location.

Allied Health Research

Lower-limb muscle-tendon surgery for adults with neurological conditions: A scoping review

Campagna. EJ, Johnston A, Dr McDonald C, Dr Hastings-Ison T and Prof Williams GP

Aim: To synthesise the available evidence related to lower-limb muscle-tendon surgery in adults with neurological conditions. Currently, there are no adult clinical practice guidelines (CPGs) published to help guide practice. In contrast, comprehensive CPGs have been published for paediatric lower-limb muscle-tendon surgery.

Methods: Scoping review Method: The Joanna Briggs Institute methodology for scoping reviews was applied. A systematic and comprehensive search was conducted in September 2024 across six databases, guideline websites, and gray literature sources. Studies were included if the population was adult or adolescent-onset neurological conditions who had undergone lower-limb muscle-tendon surgery. Two independent reviewers screened titles, abstracts, and full-text sources, and extracted data from the included studies. Data was synthesised into tables. Data was also mapped against paediatric CPGs to highlight what is known and where knowledge gaps may exist.

Results: From a yield of 6566, 77 papers were included. Of these, 51 studies reported on muscle-tendon surgery of the ankle and/or foot. Stroke was the most common neurological condition. All studies had documented how patients were selected for surgery, with the role of surgery to correct deformity in 55 studies. However, there was little consistency with treatment approaches or the intensity of rehabilitation that was delivered. Optimal timing for when surgery should be performed was also poorly documented in the included studies.

Conclusion: Substantial evidence gaps currently exist to inform the management of adults with neurological conditions undergoing lower-limb muscle-tendon surgery. Further research to address these gaps is required to inform clinical practice.

Allied Health Research

Evaluation of Partnered-Pharmacist Discharge Prescribing for Multimodal Analgesia and Appropriate Opioid Prescribing Following Non-Complex Surgery

Konstantatos M, Bui T, Konstantatos A, Herath H, Jokanovic N, Poole S

Opioid analgesia is used frequently in postoperative pain management. Inappropriate opioid prescribing can cause adverse effects, dependence and misuse. Pharmacists are well-placed to guide safer opioid prescribing.

Aim: To evaluate the impact of pharmacist involvement in discharge prescribing for non-complex surgical patients on appropriateness of opioid quantity and use of multimodal analgesia.

Methods: A retrospective observational study of surgical inpatients at The Alfred hospital between May-2022 and April-2023 was performed. A random sample of 1000 surgical encounters were initially screened against inclusion criteria: age ≥18 years, opioid-naive on admission, postoperative length of stay 24-96 hours. Secondary screening was performed to include encounters with a discharge prescription generated. The primary outcome compared appropriateness of opioid prescribing at discharge between pharmacist and doctor-generated prescriptions. Appropriateness was defined as opioid under-prescription, <3 times the oral morphine equivalent (OME), or over-prescription, >7 times OME, administered 24 hours prior to discharge. Secondary outcomes included paracetamol and nonsteroidal anti-inflammatory drug (NSAID) prescribing at discharge and the impact of prescription generation timing (<12 vs >12 hours from discharge) on opioid appropriateness.

Results: Of 615 encounters initially eligible, 350 received a prescription and were included. Most discharge prescriptions were pharmacist-generated over doctor-generated (n=274 [78.3%] vs n=76 [21.7%]). There was comparable opioid use in the 24 hours preceding discharge (median OME 15mg vs 15mg, p=0.53) and appropriateness, with similar rates of over- (3.6% vs 2.6%, p=0.67) or under-prescribing (56.9% vs 51.3%, p=0.38) between pharmacists and doctors. Pharmacists were significantly more likely to prescribe NSAIDs (88.7% vs 78.9%, p=0.028) and recommend paracetamol (98.5% vs 93.2%, p=0.0006) at discharge. Timing of script generation did not significantly affect appropriateness of opioids prescribed on discharge.

DISCUSSION: Pharmacist involvement in discharge prescription generation yielded comparable appropriateness in quantity of prescribed opioids and highlights a role for pharmacists in optimising opioid sparing-strategies following non-complex surgeries.

Allied Health Research

Exploring the barriers and enablers of airway clearance therapy and exercise amongst adults with bronchiectasis: a patient perspective

EM Webb, AE Holland, J Bondarenko, BM Button, RG Stirling, A Wan, AL Lee

Introduction/Aim: Airway clearance therapy (ACT) and physical exercise are recommended to prevent pulmonary exacerbations and improve secretion clearance and exercise tolerance in adults with bronchiectasis. Adherence with routine ACT is frequently poor, and engagement in regular exercise is relatively unknown. This study explored the barriers and enablers of performing ACT, physical exercise and attending pulmonary rehabilitation (PR) from the perspective of adults with bronchiectasis.

Methods: Adults with a confirmed diagnosis of bronchiectasis undertook a semi-structured interview. Interviews were recorded, transcribed verbatim and coded. Inductive content analysis was used to explore the barriers and enablers and establish key themes.

Results: Thirty adults were included; 18 (60%) were female, median age 74 (interquartile range 67-80) years. Positive experiences with ACT to manage respiratory symptoms facilitated engagement. Barriers to ACT were the negative emotional connotations, including stigma, monotony and the time-consuming nature of therapy. Enablers of exercise engagement were physical, psychological and respiratory health benefits, and that exercise was a time efficient form of ACT. Lack of ability or self-belief was a barrier to engaging with physical exercise. Flexibility in PR model delivery and confidence in the supervised exercise and education programme provided by healthcare providers were enablers of PR, while lack of awareness of potential benefits, and geographical restrictions were barriers to PR participation.

Conclusion: Engagement with ACT, physical exercise or PR relies on participants' recognition of the benefits in daily life. Identification and accommodation of these barriers and enablers may facilitate uptake and engagement.

Allied Health Research

Does Measuring Energy Expenditure Via Indirect Calorimetry Change Nutrition Prescription in Mechanically Ventilated, Critically ill Adults?

Day S; Lambell K, Ridley E, Tatucu O, Gantner D, Paul E, Gilmartin-Thomas J

Introduction: Under and over provision of energy to critically ill patients has negative consequences. Guidelines recommend measuring energy expenditure (mEE) via indirect calorimetry (IC) in patients admitted to the Intensive Care Unit (ICU). However, limited data exists informing how using IC as part of clinical practice changes nutrition prescription at the bedside.

Objectives: This study aimed to quantify the percentage change in energy prescription following a valid IC measurement when compared to a predictive equation estimate in critically ill adults.

Methods: Retrospective single-centre observational study of IC measurements performed in mechanically ventilated patients at The Alfred ICU in 2023. Admitting diagnosis, patient demographics, mEE(kcal), and nutrition prescription pre-and post-IC measurement were collected via medical records. A clinically significant change in energy prescription following an IC measurement was pre-determined as an increase or decrease of ≥10%. Data are presented as n(%), mean±standard deviation or median [interquartile range].

Results: A total of 243 IC measurements were included, performed on 163 patients, age 51±17 years with an ICU length of stay at time of IC measurement of 25 [18-39] days). mEE was 2094±593 kcal. Change in nutrition prescription occurred as follows: decrease by ≥10% in 61 (25%) cases, increase by ≥10% in 53 (22%) cases and no change in 129 (53%) cases. There were no significant associations between percentage change in energy prescription and admitting diagnosis, APACHE-2 scores, age, ICU length of stay and hospital length of stay. Higher weight was significantly associated (p=0.023) with increased change in energy prescription.

Conclusion: In a tertiary ICU with specialist Dietitians, using IC changes nutrition prescription at the bedside in around half of cases. More research is required to understand the clinical and functional impacts of IC-directed nutrition provision compared to standard care.

Allied Health Research

A Flexible Approach to Allied Health Attendance at General Medicine Risk Rounds Improves Patient Outcomes and Team Communication

Russell E, Leslie A, Meikle L, Yang W

Risk rounds are designed to reduce the risk of harm and hospital acquired complications in older people. General Medicine Risk Rounds commenced at Sandringham Hospital in 2022. Patients are selected for Risk Rounds if they have a high 4AT, MUST, FRASS or Braden. An internal audit in 2025 identified that when allied health attend Risk Rounds, only 46% of the time the discipline was aligned with these 'highlighted risks' as it was a rotating roster. 27% of comprehensive care plans containing risk mitigation strategies were updated after Risk Rounds.

Aim: To review the allied health response and multi-disciplinary team communication regarding Risk Rounds and the risk mitigation strategies in the General Medicine Acute Aged Care ward at Sandringham Hospital.

Methods: Utilising quality improvement methodology, the MDT including Clinical Nurse Manager, ANUMs, Physiotherapists, Occupational Therapist, Social workers and dieticians, identified and tested several change ideas designed to specifically to increase the appropriate attendance of AH at Risk Rounds, increase Comprehensive Care plan completion and foster a team culture of proactive risk mitigation on the ward.

Results: Resulting modifications included screening of all patient files by allied health clinicians prior to Risk Round to determine requirement for attendance/handover and requirement for comprehensive care plan updating following each Round. The successful implementation of these strategies has resulted in appropriate allied health attendance at Risk Rounds (100% of recorded occasions) and improved communication of risk mitigation strategies via the comprehensive care plan (100% of recorded occasions).

Conclusion: Management of risk of harm and hospital acquired complications in older people is complex and requires a tailored, interdisciplinary approach. It is vital that the necessary expertise is available to implement effective risk mitigation strategies. Appropriate documentation via the comprehensive care plan is imperative to ensuring effective communication of risk mitigation strategies is disseminated to the multi-disciplinary team.

Allied Health Research

Exploration of expert occupational therapists' clinical reasoning when planning cognitive rehabilitation

Wheatcroft J, Lannin NA, Baker A, Unsworth CA

Background And Objectives: Cognitive rehabilitation for patients with acquired brain injury (ABI) is complex, requiring skilled clinical reasoning. There is limited research explicating the clinical reasoning of expert occupational therapists in this specialised practice area. This study aimed to explore expert occupational therapists' clinical reasoning when planning cognitive rehabilitation for patients with ABI.

Method: This ethnographic study employed patient video case studies to elicit verbal think-aloud dialogue from expert occupational therapists recruited from a single hospital network. Deductive content analysis with a priori coding identified types and frequency of clinical reasoning.

Results: Expert occupational therapists (n=7) with a mean of 13 years (3.6 SD) experience working in ABI provided, on average, 46.4 minutes (SD 2.9), totalling 325 minutes of think-aloud data. Procedural reasoning emerged as the most frequently used type of reasoning, with participants using it on average 47.9 times during data collection (SD = 8.0). Eight types of dual reasoning were used in combination with procedural/generalisation, occurring most frequently (mean 9.4, SD 6.1). Expert clinicians moved seamlessly across multiple types of reasoning, proposing clear, evidence-based cognitive rehabilitation plans, most frequently citing the rehabilitation strategy errorless learning for the case scenarios.

Conclusion: Using a think-aloud method, procedural reasoning emerged as the most prevalent type of reasoning, consistent with prior research. Experts quickly shift to generalisation reasoning, drawing on knowledge from previous cases to derive conclusions. Further studies will explore the differences between novice and expert clinical reasoning and evaluate methods to support novices in planning cognitive rehabilitation, ultimately improving patient rehabilitation.

Allied Health Research

Enhancing Hospital-Based Wheelchair and Seating Processes Using Implementation Science

Wheatcroft J, Robertson B, Smith M, Scher B, Wilson E, Brooks C, Bahr F, Roberts K and Lannin NA

Introduction: Assessing wheelchair and seating needs for adults in hospitals is complex and time-consuming. Inpatient Occupational Therapists and Physiotherapists must possess the expertise and knowledge to confidently and effectively prescribe a wheelchair to meet patients' needs. This process involves evaluating the anatomical presentation, functional abilities, environmental context, and occupation-focused goals to ensure that the selected equipment supports mobility, participation, and overall well-being.

Objective: This project aimed to understand current knowledge and confidence and develop interventions to support Occupational Therapists and Physiotherapists in assessing and recommending wheelchair provision.

Methods: This study employed a pre/post survey design to identify knowledge and confidence gaps and evaluate the impact of newly developed and implemented resources on supporting Occupational Therapists and Physiotherapists in wheelchair and seating assessments and provision. A working party of Occupational Therapists and Physiotherapists developed resources and delivered targeted training to build staff capability and confidence.

Results: The initial survey (n = 43) indicated that 46% of inpatient Occupational Therapists and Physiotherapists were confident in prescribing wheelchair and seating solutions. In response, a suite of resources was identified, developed, and packaged, including local clinical guidelines, documentation templates, and reference videos focused on pressure care, wheelchairs, and postural assessment. The resources were introduced alongside structured training sessions designed to build staff capability and confidence. A post-implementation survey (n=54) demonstrated an increase in reported confidence (to 61%) among the Occupational Therapy and Physiotherapy teams. Survey open-ended qualitative comments described the resources as beneficial.

Conclusions: Clinicians' confidence in conducting wheelchair and seating assessments and subsequent provision was enhanced by developing guidelines and resources. Occupational therapists and physiotherapists frequently collaborate to provide wheelchairs and seating systems. Hence, establishing consistent processes is beneficial to ensure that patients receive optimal care. Future research considering consumer perspectives may be beneficial in enhancing in further wheelchair education.

Allied Health Research

Growing the wellbeing and resilience of junior physiotherapists

Wheatcroft J, Robertson B, Smith M, Scher B, Wilson E, Brooks C, Bahr F, Roberts K and Lannin NA

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Allied Health Research

Screening, Characterising and Assessing Malnutrition in the Hospital Setting: A Large-Scale Point Prevalence Survey

Kate Connell MNutrDiet, APD, Andrea Elliott PhD, APD, Emma McShane MDiet, APD, Andrea Bramley PhD, AdvAPD, Lauren Hanna PhD, APD, Kate Furness PhD, APD

Aim: To assess the prevalence of undernutrition, overnutrition, and simultaneous malnutrition in a hospital setting, as well as undernutrition risk and dietetic intervention rates.

Methods: A point prevalence survey was conducted annually from 2016 to 2024 (excluding 2020–2021 due to Coronavirus Disease 2019) across three metropolitan health service hospital sites. Eligible multiday inpatients underwent bedside assessments and medical record reviews to determine Body Mass Index, Malnutrition Universal Screening Tool scores, and undernutrition status based on either the International Classification of Diseases, 10th Revision, or the Global Leadership Initiative on Malnutrition. Data were analysed descriptively.

Results: Of 5186 patients surveyed, 21.2% were undernourished, 39.5% were overnourished, and 4.8% were simultaneously under- and overnourished. Just over one-third (37.4%) of all participants were at risk of undernutrition. Dietitian intervention rates were highest among the simultaneously malnourished (70.6%) and undernourished (69.6%), and low among the overnourished (3.6%).

Conclusion: The findings underscore the need for improved detection of simultaneous malnutrition and increased rates (towards 100%) of dietary intervention among patients with either under- or simultaneous malnutrition during a patient's hospital stay.

Allied Health Research

Cognition in Autoimmune Encephalitis: A Study by the Australian Autoimmune Encephalitis Consortium

Katherine Y. Ko, Nabil Seery, Sarah Griffith, Robb Wesselingh, Christina Kazzi, Daniel J. Pearce, Tiffany Rushen, Tracie H. Tan, Lauren Melitsis, Hannah Ford, Catherine Meade, Andrew Duncan, Wendyl D'Souza, Ernest G. Butler, Anneke Van Der Walt, Udaya Seneviratne, Katherine Buzzard, Sudarshini Ramanathan, Stephen W. Reddel, Todd A. Hardy, Helmut Butzkueven, Terence J. O'Brien, Rubina Alpitsis, Charles B. Malpas and Mastura Monif

Autoimmune encephalitis (AE) is increasingly recognised as a major cause of persistent cognitive morbidity, yet its chronic neuropsychological sequelae and their variation across antibody subtypes remain poorly defined.

Aim: In the largest cohort of AE patients studied to date, we aimed to comprehensively characterise long-term cognitive outcomes and delineate subtype-specific cognitive profiles.

Methods: We prospectively studied 106 adults with confirmed AE recruited from seven Australian hospitals (2018-2025). Patients completed a standardised neuropsychological battery assessing attention/processing speed, language, memory acquisition, memory retrieval, and executive function. Subgroup comparisons were performed across antibody-defined groups: leucine-rich glioma-inactivated 1 (LGI1, n=25), N-methyl-D-aspartate receptor (NMDAR, n=23), seronegative (n=45), and other seropositive AE (n=13). Cognitive impairment was defined as ≥1.5 SD below normative means on ³2 tests. Pattern and frequency analyses were used to examine domain-level deficits and heterogeneity.

Results: Patients were assessed an average of 37 months post-admission (M_{age}=52.3 years; 59% female). Cognitive impairment was prevalent, with 42% showing deficits in ³2 domains. Group-level analyses revealed the greatest impairments in executive function (Hedges' g=.47), followed by memory retrieval (g=.40), language (g=.25), and attention/processing speed (g=.19). Subtype profiles were distinct: NMDAR patients showed deficits in attention/processing speed and executive function; LGI1 patients in memory retrieval; other seropositive patients in attention/processing speed and executive function; and seronegative patients displayed broader impairments across executive function, memory, and language. Poorer cognition was associated with greater disease severity at admission.

Conclusion: Chronic AE is characterised by frequent, heterogeneous cognitive deficits that vary by antibody subtype, persisting years after initial illness. These findings provide the first large-scale delineation of subtype-specific cognitive profiles, offering crucial insights for precision rehabilitation and long-term follow-up, ensuring that recovery is measured not only by physical function but also by meaningful improvements in cognitive wellbeing.

Allied Health Research

Subjective Psychiatric Symptoms in Autoimmune Encephalitis: Findings from The Australian Autoimmune Encephalitis Consortium

Katherine Y. Ko, Nabil Seery, Sarah Griffith, Christina Kazzi, Robb Wesselingh, Tiffany Rushen, Tracie H. Tan, Hannah Ford, Catherine Meade, Marie F. O'Shea, Laurie McLaughlin, Genevieve Skinner, Mirasol Forcadela, Amy Halliday, Andrew Duncan, Ernest G. Butler, Anneke Van Der Walt, Tomas Kalincik, Wendyl D'Souza, Udaya Seneviratne, Katherine Buzzard, Richard Macdonell, Sudarshini Ramanathan, Stefan Blum, Stephen W. Reddel, Todd A. Hardy, Helmut Butzkueven, Terence J. O'Brien, Rubina Alpitsis, Charles B. Malpas, and Mastura Monif

Autoimmune encephalitis (AE) is a rare but devastating illness with life-changing consequences. Psychiatric symptoms are highly prevalent, yet remain largely absent from routine outcome monitoring, overlooking a key determinant of recovery and long-term quality of life.

Aim: To characterise self-reported psychiatric symptoms in AE and examine associations with functional and disease severity outcomes.

Methods: Eighty-seven AE patients (M_{age}=54.5, SD=17.8) from the Australian Autoimmune Encephalitis Consortium completed the SPECTRA–Indices of Psychopathology 12 months post-onset, time-matched with Modified Rankin Scale (mRS) and Clinical Assessment Scale in Autoimmune Encephalitis (CASE) scores.

Results: Most patients had favourable functional recovery (84.1% with mRS≤2; median mRS and CASE=2). Yet SPECTRA scores showed clinically elevated psychiatric symptoms across multiple domains, especially depression, post-traumatic stress, suicidal ideation, and cognitive dysfunction. Patients with seronegative AE reported the greatest symptom burden. Pre-existing psychiatric diagnoses predicted more severe psychiatric symptoms and poorer outcomes. Conventional functional and disease severity measures (mRS and CASE) accounted for only a small proportion of the variability in patients' psychological symptoms (8-26%), indicating that these scales poorly capture the psychiatric burden of AE. Adding CASE scores to the model provided only minimal improvement beyond mRS, suggesting that even disease-specific tools do not adequately reflect the full extent of one's psychiatric symptoms.

Conclusion: Despite good functional outcomes, AE patients report high psychiatric burden that is invisible to standard clinical metrics. This exposes a critical gap between "recovery on paper" and lived experience. Embedding routine multidimensional psychiatric and psychological screening into AE care is critical to bridge this gap, driving holistic rehabilitation, focused mental health support, and lasting recovery.

Allied Health Research

Neuropsychological Impairment in Autoimmune Encephalitis: Patient-Informant Discrepancies and Cognitive Test Outcomes

Katherine Y. Ko, Nabil Seery, Sarah Griffith, Christina Kazzi, Robb Wesselingh, Tiffany Rushen, Tracie H. Tan, Catherine Meade, Marie F. O'Shea, Mirasol Forcadela, Andrew Duncan, Amy Halliday, Hannah Ford, Ernest G. Butler, Anneke Van Der Walt, Wendyl D'Souza, Udaya Seneviratne, Katherine Buzzard, Richard Macdonell, Sudarshini Ramanathan, Stephen W. Reddel, Todd A. Hardy, Helmut Butzkueven, Terence J. O'Brien, Rubina Alpitsis, Charles B. Malpas, and Mastura Monif

Cognitive symptoms in autoimmune encephalitis (AE) are common yet remain poorly captured by standard clinical outcome measures. There is a critical need for tools that can capture the profound impact of the illness on patients and caregivers.

Aim: This study investigated neuropsychological functioning in AE patients using both self- and informant-reported outcomes, and examined the relationship between these subjective reports, cognitive outcomes, and clinical severity.

Methods: Seventy-seven individuals with AE (M_{age}=54.04, SD=18.03) were recruited through the Australian Autoimmune Encephalitis Consortium. Patients and caregivers completed the Neuropsychological Impairment Scale (NIS), a validated questionnaire assessing perceived cognitive deficits of patients across multiple domains. Patients also underwent psychometric testing of attention and working memory, executive function, visuospatial function, language, and learning and memory. Functional outcome measures—the Clinical Assessment Scale for Autoimmune Encephalitis (CASE) and modified Rankin Scale (mRS)—were collected within six months of NIS completion.

Results: Assessments occurred a mean of 12 months post-symptom onset (SD=5.77). Most patients (84%) demonstrated good functional outcomes (mRS≤2; median mRS=2; median CASE=2). Despite this, all patients reported significant impairment in Cognitive Efficiency and Learning/Verbal domains, with deficits observed across nearly all NIS subscales. Discrepancies emerged between patient and caregiver reports: patients more frequently reported severe memory deficits, whereas caregivers more often endorsed elevated scores on Critical Items, reflecting medical and neurological impacts. Moderate correlations between NIS scores and objective cognitive tests indicated that patient-reported deficits corresponded with measurable impairments, even if not fully detected by formal testing.

Conclusion: These findings reveal a high burden of neuropsychological impairment in AE, even among patients deemed functionally recovered. Current functional measures may under-represent the real-world impact of AE on cognition. The divergence between patient and caregiver perspectives highlights the importance of multidimensional cognitive assessment in both clinical and research contexts to capture AE-related cognitive difficulties accurately. by meaningful improvements in cognitive wellbeing.

Allied Health Research

Adapting and Operationalising Spinal Cord Injury Guidelines to Support Inpatient Occupational Therapy Practice

Ms Maddison Smith, Mrs Bryley Scher, Ms Sia Horrobin, Ms Vanessa Russell, Dr Karen Roberts, Mrs Jacqueline Wheatcroft

Introduction: Clinical practice guidelines (CPGs) such as the Canadian Spinal Cord Injury Best Practice Guideline (Can-SCIP) are proposed to enhance practice. Barriers to implementing CPGs, such as complexity, may make guidelines overwhelming for clinicians. Tailoring CPGs to the local context supports implementation.

Objective: This project aimed to translate Can-SCIP guidelines for occupational therapists working with inpatients following Spinal Cord Injury (SCI).

Method: The ADAPTE process and CAN-IMPLEMENT framework structured the guideline adaptation process for occupational therapists in a large metropolitan hospital. A steering group screened Can-SCIP recommendations for inclusion in a local protocol. A stakeholder group collaborated to align recommendations, identify gaps, and develop resources. A survey assessed clinicians' confidence before and after implementation and training on the local SCI protocol.

Results: The steering group (n=4) identified 79 of 585 Can-SCIP guideline recommendations for inclusion in the local SCI protocol. Stakeholders (n=9) determined resources required to deliver Occupational Therapy relevant recommendations, including a clinical protocol, clinician pathway, education package, implementation session, and patient resources.

Occupational Therapists surveyed (n=14) all had over two years of experience, but many (57%) had less than one year specifically in SCI. Pre-training ratings indicated low confidence across all SCI-related areas. After training, confidence improved in all areas, most notably in identifying guidelines for initial contact, planning functional assessments, and completing upper limb assessments. Knowledge of SCI guideline recommendations also improved.

Conclusion: Guideline implementation is a timely but essential process to ensure best practice in specialised areas of clinical work such as SCI. The ADAPTE process and CAN-IMPLEMENT framework provided a structured approach to guideline adaptation and supported the selection of CPG recommendations into a localised occupational therapy SCI protocol. Targeted resource development and implementation demonstrated increased clinician knowledge and confidence in treating inpatients with SCI by occupational therapists.

Allied Health Research

Effectiveness of Inpatient Activity-Based Interventions on Functional Independence After Stroke: A Systematic Review

Grant T, Wales K, Jolliffe L, Schneider E, Glascott J, Sansonetti D, Drummond AE, Lannin NA

Background: Stroke is a leading cause of disability, and stroke survivors often experience difficulties completing activities of daily living (ADL) as a result of their stroke deficits. Research supports early occupational therapy rehabilitation however the effectiveness of activity-based interventions in the inpatient setting remains unknown.

Aim: To determine the effectiveness of inpatient activity-based retraining targeting basic activities of daily living (b-ADLs) and/or simple cognitive instrumental activities of daily living (C-IADL) to optimise stroke survivors functional independence.

Method: EMBASE, MEDLINE and CINAHL were searched from inception until 31/07/2025 using a systematic review design. Studies which were randomised controlled trials or quasi randomised trials were included if they: were conducted in an inpatient setting; evaluated effectiveness of activity-based interventions specific to b-ADL and simple C-IADL; included ADL performance measures in stroke survivors; and were published in English. Studies were excluded if they used virtual reality or computer-based retraining.

Results: 7,546 articles were screened at title and abstract following removal of duplicates. Six trials met the inclusion criteria including 254 participants. Activities explored within studies included b-ADLs such as dressing (n=5), showering (n=2), grooming (n=1), toileting (n=1) and feeding oneself (n=1). Simple C-IADLs included were cooking (n=2) and cleaning/laundry (n=3). ADL performance outcome measures were meta-analysed and results found no clinically significant difference (SMD = 0.27; 95% CI -0.12, 0.66; p = 0.17; I^2 = 49%). Given only two studies explored quality of life and satisfaction these results were not meta-analysed.

Conclusion: There was no significant difference in ADL performance in stroke survivors within the inpatient setting; however, these findings are based on a small number of studies with limited samples. Further rigorous research is required to form clear guidelines for occupational therapy practice and until this information is available, clinicians should continue to carefully document intervention approaches and monitor patient change.

Allied Health Research

Hybrid Menu Model Evaluation

Moss J, Anderson R, Bramley A, Parker I, Astbury A, Grant R, Guler A, Galea S, Monaghan C, Beaty C

Meal ordering processes in hospital settings impact both dietary intake and patient mealtime satisfaction. The Alfred recently introduced a hybrid menu model allowing patients to place meal orders with assistance from a menu monitor or using a self-ordering software.

Aim: To evaluate the hybrid menu model for patients on oral diets and explore the impacts of the meal ordering process on patient meal choice and satisfaction.

Methods: A mixed methods cross sectional approach was used to explore patient meal choice and satisfaction across The Alfred in February and August 2025. Data regarding patient choice was collected through meal order summary statistics. Data regarding patient experience of meal ordering processes was collected through semi-structured interviews and surveys with patients and menu monitors. An inductive approach to thematic analysis was used for all semi-structured interviews to obtain lived experiences of barriers and enablers to meal ordering processes. Quantitative data was analysed via excel. Statistical significance of patient choice was determined by a Chi-Square test.

Results: Meal-ordering data showed statistically significant differences ($p=<0.001$) in the meal ordering process used in August vs February (Feb (n=6456) 82% face-to-face, Aug (n=8189) 88% face-to-face). Despite a reduction in mobile meal ordering use (6%), patient choice increased from February (74%, n=8688) to August (79%, n=10305). One hundred and forty-eight patient feedback surveys favoured face-to-face ordering (78%). From thematic analysis across all qualitative data, common themes emerged that influenced meal ordering; 'barriers to self-ordering software uptake', 'customer service' and 'system improvements'.

Conclusion: Overall patient choice has increased since the introduction of the hybrid menu model, however this research suggests there are multiple barriers to the uptake of self-ordering software. Patient engagement, software usability, and system improvements are crucial to maximise the functionality of systems to support patient meal choice in the hospital setting.

Allied Health Research

Brain Injury Within Intimate Partner Violence: What are the Cognitive Effects?

Makovec Knight, Jennifer, Hannon, O., Spitz., G., Astridge, A., Copas., C., Duarte Martins., B., Rowse., R, McDonald., S., Padgett.,C, Meyer., S, Shultz.,SR, Symons., GF Ponsford., J

Intimate partner violence (IPV) is a worldwide health concern with devastating implications for physical, mental, and cognitive health. IPV-associated brain injuries (IPV-BI) induced through impacts to the head (e.g., mild traumatic brain injury) and non-fatal strangulation (NFS; i.e., a hypoxic-ischemic injury) are common. Identifying their consequences is vital to inform clinical care.

Aim: To identify if women with IPV-BI had cognitive impairment more than 6 months after exposure to mTBI and/or NFS.

Methods: Cross sectional design with 3 groups (Participants were at least 6 months removed from violence and recruited from Melbourne community in 2024 and 2025): IPV-BI, women exposed to IPV, and healthy age-matched controls. All participants completed medical history, biopsychosocial questionnaires, and cognitive tests of premorbid IQ, learning and memory, processing speed and executive functions.

Results: 146 women aged 40.99 years (SD = 13.97) were included: 46 with IPV-BI, 42 with IPV and 58 Healthy controls. For women with >6 IPV-BI's, 84.2% had sustained their brain injuries from both NFS and mTBI. IPV-BI was associated with poorer performances on the Rey Auditory Verbal Learning Test (RAVLT) total and delayed recall trials. Planned comparisons revealed that women with >6 brain injuries scored significantly lower than those with 1-5 BI's, IPV or healthy controls, with large effect sizes. These associations remained significant after controlling for age, premorbid functioning, PTSD, depression, anxiety, substance use disorder, and other causes of brain injury.

Conclusion: Impairments in memory and new learning were evident beyond six months post-injury and outcomes worsened with cumulative exposure to brain injury (>6). These cognitive functions are critical for sustaining work, education, and other life roles, underscoring the profound and complex impacts of IPV. Results highlight the need for routine screening, assessment, and targeted clinical care for this underserved population.

Allied Health Research

Elective Spinal Fusion Surgery: A Retrospective Audit of Pre-Operative Physiotherapy-Led and Medical-Led Patient Care Pathways

Griffiths Z, Maciel J, Haley C, Burge AT

Patients who undergo elective spinal fusion surgery experience variations in pre-operative care pathways, with complex cases determined to be suitable surgical candidates at a spine surgery consensus meeting. Patients may attend a medical-led clinic or Advanced Musculoskeletal Physiotherapist (AMP) clinic; however, the relationship between patient care pathways and important clinical features, such as documented pain pattern, is poorly defined.

Aim: To describe the clinical features and care pathways of patients who underwent elective spinal fusion surgery at the Alfred Hospital.

Methods: A retrospective audit of patients who underwent elective spinal fusion surgery (01/01/2024-31/12/2024). Variables were demographic and clinical characteristics (including pain patterns), pre-operative care pathways (medical-led or AMP clinic; wait time from initial appointment to surgery consensus meeting, number of appointments) and surgical details (reason, location, unit). Data were analysed descriptively.

Results: Over the audit period, 57 patients (age mean 58 years, range 21-83) underwent surgery. Most were male (56%), resided in a Metropolitan area (58%) and presented with limb pain (91%). Surgery was most commonly for degenerative spine pathology (95%) in lumbar spine (61%) undertaken by Neurosurgery unit (63%, orthopaedic 37%). All 20 AMP clinic patients had documented limb pain (predominantly limb or equal limb/back pain). Of the 37 patients who attended medical-led clinics, 54% did not have primary pain location documented. Median wait time to surgery consensus meeting was 218 days (IQR 186-473) in AMP clinics compared to 235 days (IQR 104-625) in medical-led clinics. Median number of pre-operative appointments was 4 (IQR 2-5) in AMP clinics compared to 5 (IQR 2-8) in medical-led clinics.

Conclusion: Comparable pre-operative care pathways were experienced by patients in AMP and medical-led clinics; however, clinical pain pattern was more frequently documented for patients in AMP clinics. Further work is required to determine the most efficient model of care for individual patients.

Allied Health Research

Effects of Increased Dose of Acute Care Physiotherapy in People Following Orthopaedic Surgery: A Systematic Review

Raper E, Falloon K, Romero L, Holland AE, Burge A, Kimmel L

The rates of elective and non-elective orthopaedic surgeries are increasing globally. Early post-operative physiotherapy interventions aim to improve patient outcomes; however, the effect of increased dose of therapy is unknown.

Aim: To assess the effects of an increased dose of early post-operative physiotherapy following orthopaedic surgery

Methods: Electronic databases were searched to identify randomised controlled trials (RCTs) involving adults in the acute setting following orthopaedic surgery with additional dose of active physiotherapy intervention (PROSPERO-CRD42024510943). Two review authors independently screened for inclusion, completed risk of bias assessments and extracted data. Data presented here are for increased therapy dose(s) compared to usual care or passive/sham intervention. The primary outcome was physical function. Meta-analysis was undertaken where possible (mean difference [95%CI]).

Results: 6361 references were screened, 244 full texts reviewed and 28 trials included. Of these, 18 RCTs assessed physical function (n=1173, age range: 31.3-81.3, female n=769) and 11 RCTs were rated as high risk of overall bias. Included studies ranged from 20 to 162 participants assessing outcomes from post-operative Day 2 to 24 months using variable measures, most commonly the timed-up-and-go test (TUG, n=6). At hospital discharge, increased physiotherapy dose did not improve physical function when compared to usual care (TUG-time -0.03sec [-3.2 to 3.1], 2 studies, n=134) with median differences between groups ranging from 1-22s favouring the intervention (2 studies, n=96). One study comparing increased physiotherapy to passive/sham intervention demonstrated improvement in the intervention group at discharge (TUG-time -11.5s [-18.2 to -4.8], n=113) and 3-months (TUG-time -7.6s [-13.5 to -1.7], n=113).

Conclusion: The effect of increased dose of early post-operative physiotherapy following orthopaedic surgery on physical function remain unclear; study designs vary widely and study quality is generally poor. Robust studies are required to determine the effect of increased dose of physical therapy on physical function for adults following orthopaedic surgery.

Allied Health Research

The Community Control of Hypertension and Diabetes (CoCo-HD) Program in Tamil Nadu, India: Scaling up Evidence-Based Interventions

Abha Shrestha, Parasuraman Ganeshkumar, Murali Krishnan Nambirajan, Sabrina Gupta, Tilahun Haregu, Brian Oldenburg

Community-based lifestyle interventions are being widely used to address the growing burden of hypertension and diabetes in resource-constrained settings. Yet, a critical gap remains on how to effectively implement and scale these programs within existing health systems.

Aim: To describe the co-design and adaptation processes of the Community Control of Hypertension and Diabetes (CoCo-HD) program in Tamil Nadu, India.
Methods: We employed participatory approaches to co-design and adapt the ongoing NHMRC-funded CoCo-HD program (Grant ID: 1169766). The process involved a review of scientific and contextual evidence, alongside a community needs assessment (17 in-depth interviews and five focus group discussions). Forty-two stakeholders contributed to the program and its implementation strategy through six co-design workshops. The program was then iteratively refined through expert review and pilot testing with 210 participants across 10 peer support groups. Ethics clearance was obtained from Alfred Health [ID: 465/21.]

Results: The process identified five key themes: inputs, processes, outputs, challenges, and lessons learned. Stakeholder consensus among health system representatives and people living with hypertension and diabetes, combined with scientific evidence and a community need assessment, led to a new intervention delivery model. This model comprised 12 monthly sessions (60–90 minutes), facilitated by trained CHWs and peer leaders with digital tools. Monthly monitoring tracked attendance, blood pressure, blood glucose, and medication adherence. Following the pilot test, CoCoHD's was integrated into government Health and Wellness Centres. Key drivers of success included strong community engagement, a sense of government ownership, and a strategic, phased approach that embedded monitoring and evaluation.

Conclusion: Our health system-led, collaborative co-design process developed a scalable and contextually relevant program aligned with both community priorities and health system needs. This highlights the importance of participatory co-design to maximise program implementation, sustainability and future scalability to reduce the burden of hypertension and diabetes in resource-constrained settings.

Allied Health Research

Advanced Musculoskeletal Physiotherapy Telehealth Benchmarking Survey: Upper and Lower Limb Conditions

Bennett L, Maciel J, Haley C, Burge AT, Harding P, McDonald C

Advanced Musculoskeletal Physiotherapists (AMPs) routinely screen patients in surgical outpatient clinics to inform clinical care. Increasing use of Telehealth (TH) to assess patients referred for surgery from the AMP perspective merits investigation.

Aim: To evaluate AMP confidence with using TH to inform conservative management and perceived effectiveness for screening surgical candidates with upper and lower limb conditions, as well as risk concerns.

Methods: A national prospective study was conducted (Jan-Dec 2023). Physiotherapy managers of AMP services were identified via professional networks to distribute a REDCap survey to AMPs. Respondents were asked regarding service details and to rate (5-point Likert scale; 4-5 high): confidence and perceived effectiveness of TH assessment (phone, video); and risk concerns. Data presented are for upper and lower limb conditions classified as osteoarthritis (OA) and non-OA (frozen shoulder, rotator cuff/labral tear, meniscal/ligamentous knee pathology). Data were analysed descriptively.

Results: Of the 69 participants (five states, one territory); 38 (55%) had ≥10 years' experience and 38 (55%) managed patients from regional areas. The largest proportion of responses expressed high levels of confidence for TH video use in OA (71%) and non-OA (63%) conditions. For TH phone, a similar proportion had high confidence levels for OA (50%) and non-OA conditions (45%). For TH video, the largest proportion expressed high perceived effectiveness in OA (65%) and non-OA (44%) conditions. Fewer AMPs had high perceived effectiveness of TH phone in non-OA (24%) than OA conditions (37%). Most AMPs were confident that combined TH/in-person assessment mitigates safety risks (84%). Only 4% of participants felt very confident using TH alone.

Conclusion: This national survey indicates that TH may be appropriately used to assess potential upper and lower limb surgical candidates, based on AMP confidence and perceived effectiveness. Future work should evaluate the utility of combined TH and in-person assessments in clinical decision-making.

Allied Health Research

Advanced Musculoskeletal Physiotherapy Telehealth Benchmarking Survey: Spinal Conditions

Haley C, Bennett L, Maciel J, Burge AT, Harding P, McDonald C

Advanced Musculoskeletal Physiotherapists (AMPs) routinely screen patients in surgical outpatient clinics to inform clinical care. Increasing use of Telehealth (TH) to assess patients referred for surgery from the AMP perspective merits investigation.

Aim: To evaluate AMP confidence with using TH to inform conservative management, perceived effectiveness for screening and importance of in-person physical assessments for spinal surgical candidates.

Methods: A national prospective study was conducted (Jan-Dec 2023). Physiotherapy managers of AMP services were identified via professional networks to distribute a REDCap survey to AMPs. Respondents were asked regarding service details and to rate (5-point Likert scale; 4-5 high): their confidence and perceived effectiveness of TH assessment (phone, video) across a range of conditions; and the importance of in-person assessment. Data presented are spinal conditions classified as osteoarthritis (OA, degenerative spinal stenosis) and non-OA (radiculopathy, myelopathy). Data were analysed descriptively.

Results: Of the 69 participants (five states, one territory); 38 (55%) had ≥10 years' experience and 38 (55%) managed patients from regional areas. The largest proportion of AMP responses expressed high levels of confidence for use of TH video in managing patients with OA (51%) and non-OA (43%) conditions. For TH phone, more AMPs had high levels of confidence managing patients with OA (39%) than non-OA conditions (26%). For TH video, the largest proportion of responses expressed high perceived effectiveness in both OA (51%) and non-OA (37%) conditions. Fewer AMPs had high perceived effectiveness of TH phone managing patients with non-OA (18%) than OA conditions (22%). Most participants rated in-person assessment as important for recommending surgical opinion (76%) and conservative management strategies (66%).

Conclusion: This national survey indicates that TH may be appropriately used to assess spinal surgical candidates, based on AMP confidence and perceived effectiveness. Future work should evaluate the utility of combined TH and in-person assessments in clinical decision-making.

Allied Health Research

Personality factors predict poorer transplantation outcomes

Rosalind Case

Heart transplantation (HTx) recipients must adhere to complex, lifelong treatment regimens. Specific personality factors may influence adherence and outcomes in cardiovascular disease, with personality disorders (PDs) posing particular challenges for HTx services. However, the influence of personality on HTx outcomes remains under-explored.

Aim: To ascertain whether anxiety, depression, and personality factors in HTx candidates are associated with adverse post-transplant outcomes, including functional capacity, adherence, readmissions, and organ rejection.

Methods: We conducted a single-centre retrospective analysis of prospectively collected data from adults who completed formal psychological measures while undertaking comprehensive assessment of HTx candidacy (2020-2024). Demographic and clinical covariates were recorded. Post-HTx outcomes among patients surviving to discharge included six-minute walk test (6MWT), 12-month readmissions, clinician-documented non-adherence, and late acute rejection (≥90 days). Associations were examined using regression and non-parametric tests with adjustment where appropriate.

Results: Of 105 candidates (75% male; mean age 51 years), 78 were waitlisted, 57 transplanted, and 53 survived to discharge. PDs were identified in 19% of candidates, while anxiety and depression were identified in 34% and 18%, respectively. Among HTx survivors, higher post-rehabilitation 6MWT distance correlated with higher conscientiousness (ρ=0.239, p=0.044) and lower neuroticism (ρ=−0.322, p=0.026). Readmissions were associated with higher neuroticism (ρ=−0.327, p=0.017) and presence of PD (median [IQR] 2 [1–3] vs 1 [0–1]; p=0.015). PDs were linked to fivefold higher odds of non-adherence (OR 5.33, 95% CI 1.15–24.79, p=0.023) and sixfold higher odds of late acute rejection (OR 6.05, 95% CI 1.18–31.07, p=0.031).

Conclusion: Anxiety, depression, and PD traits were common in HTx candidates. Conscientiousness was associated with better post-transplantation functional outcomes, whereas neuroticism correlated with poorer function and higher readmissions. Elevated PD risk was associated with post-transplant non-adherence and late acute organ rejection, highlighting pre-transplant psychological assessment as essential for risk stratification, resource allocation and improved transplantation outcomes.

Alfred Health Nursing Research

Cardiac Nurses Self-Rated Confidence and Knowledge in Patient Education: A Mixed Methods Study

Mycah Astera-Sgro

Introduction: Over the past 30 years, cardiovascular diseases have nearly doubled. Cardiac rehabilitation (CR) is a secondary prevention that effectively reduces mortality and recurrence of cardiac events. This study aimed to assess cardiac nurses' self-rated confidence and knowledge in patient education, specifically inpatient CR.

Methods: We used a mixed-methods approach, incorporating a cross-sectional survey and qualitative interviews of cardiac nurses at The Alfred Hospital in Melbourne. Quantitative data were collected via electronic and hard copy surveys, while qualitative data were obtained through one-on-one interviews. The study examined cardiac nurses' experience, training, patient education practices, self-rated knowledge and confidence in delivering the 'six-steps to cardiac recovery,' as well as barriers and educational needs. Quantitative data were analysed using descriptive statistics and subgroup comparisons, while qualitative data were analysed using thematic analysis.

Results: Forty-three nurses completed the survey. Cardiac nurses rated themselves knowledgeable on the step "promote medication adherence" and lower on "explain diagnosis and procedure". Cardiac nurses felt more confident in the step "encourage follow-up with the doctor" and less confident in the step "ensure the patient understands activity and exercise guidelines." Ten interviews were held with a median duration of thirty minutes. Key themes were identified, the process in patient education and the education of cardiac nursing staff. Identified barriers included time constraints and competing clinical demands.

Conclusion: Clinical demands and time constraints hinder patient education. Cardiac nurses rated their knowledge and confidence high, but tailored education programs can boost patient education practices, ensuring high-quality secondary prevention of cardiovascular diseases.

Alfred Health Nursing Research

Ten-Year Review Update on Nurse Practitioner Services Impact on Cost, Quality of Patient Care, Satisfaction and Waiting Times - A Systematic Review

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Background: Emergency departments are increasingly burdened by overcrowding and access block. Access block contributes to ambulance ramping and prolonged patient waiting times, resulting in delayed diagnoses, compromised care, and adverse outcomes. In response, emergency nurse practitioner services have been introduced to expand capacity, improve access, and deliver holistic, patient-centred care. Despite widespread adoption, earlier reviews identified a lack of robust evidence of service outcomes and care quality, highlighting the need for rigorous evaluation to support sustainable implementation.

Objective: Update the best available evidence evaluating the impact of nurse practitioner services on cost, patient satisfaction, and patient outcomes in emergency and urgent care settings.

Design: This systematic review was guided by JBI methodology and was registered with PROSPERO. The review has been reported following the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) guidelines.

Methods: A search was conducted in Embase, Medline, CINAHL, Cochrane Library, Emcare, Web of Science Core Collection, and Scopus for primary research studies published between 2014 and 2024. Reference lists of included studies were also screened. Eligible studies examined nurse practitioner services in emergency or urgent care settings, reporting outcomes of cost, patient satisfaction, waiting times, or service efficiency. Screening, data extraction, and quality appraisal of articles were conducted by reviewers and findings synthesised narratively.

Results: 2,329 records were screened with 236 full-text articles reviewed. 18 underwent critical appraisal and data extraction. Outcome measures yielded mixed results, with favourable findings reported regarding nurse practitioner services.

Conclusions: Global evaluation of nurse practitioner services in emergency care remains inconsistent. Nevertheless, emerging evidence supports their positive impact, particularly in improving patient outcomes. To effectively inform policy, workforce planning, and clinical integration, there is a need for professional benchmarks that provide clear frameworks of patient-centred outcomes and operational impacts.

Alfred Health Nursing Research

New diagnosis of paroxysmal atrial fibrillation after stroke using an external telemetry device

Estelle Hamson, Esme Muller, Geoffrey Cloud

Background: Atrial fibrillation (AF) is a well-established cause of ischaemic stroke (IS), yet paroxysmal AF (pAF) often remains undetected during routine inpatient monitoring. The use of an external telemetry device (ETD) to detect AF is a key investigation following an Embolic Stroke of Undetermined Source (ESUS).

Aim: To evaluate the detection rate of AF using an external telemetry device in ESUS patients.

Method: A single centre, retrospective cohort study of patients fitted with an ETD for 29 days after a confirmed ischaemic stroke of ESUS aetiology between January 2023 and December 2024. Patients excluded from the study were those without or unable to use a smart phone.

Results: 229/ 621 (37%) IS patients met diagnostic criteria for ESUS. 95/229 (41%) ESUS patients met the inclusion criteria for ETD monitoring. The median age was 69yrs; 64% female. The ETD was applied on median of 4 days after stroke ictus and worn for a median of 29 days.

pAF or atrial flutter was detected in 3/95 ESUS patients (3%) with detection at day 1, 10 and 15 respectively. Median age of AF detection was 70 years. Other cardiac abnormalities were detected in 5 patients (5%) including heart block and supraventricular tachycardia.

Conclusion: 59% of ESUS patients were unable to use an ETD. 29 days of ETD monitoring is associated with a low rate of pAF detection in ESUS patients able to use a smart phone. Implantable cardiac loop recorders may be more applicable and yield greater diagnosis of pAF in ESUS.

Alfred Health Nursing Research

Nursing Workforce and Education Challenges to Implementing Extracorporeal Membrane Oxygenation Services in Australia

Yee Hian Quah, Paul Ross, Jayne Sheldrake, Laura Ronayne, Padraig Keogh, Darrel DuPlooy, Malcolm Stewart, Melissa Nicholls, Danielle Berkovic, Carol Hodgson, Andrew Udy

Background: Extracorporeal membrane oxygenation (ECMO) is a type of mechanical circulatory support that is increasingly utilised for severe cardiorespiratory failure in the intensive care setting (ICU). ECMO is resource-intensive and as a result, the development of ICU-led ECMO teams has provided opportunities for specialist nursing roles and introduced new care delivery models.

Aim: To explore the role and responsibilities of a novel extracorporeal life support advanced practice nursing team (ECLS-APNT) in a high-volume EMCO ICU.

Methods: Descriptive qualitative design using a combination of semi-structured interviews and confirmatory observation in the clinical ICU setting.

Results: Six (n=6) semi-structured interviews and 23.5 hours of direct observation of the ECLS-APNT were conducted. Five themes concerning the roles and responsibilities of the ECLS-APNT were identified from the interviews and direct observation: 1) internal ICU responsibilities such as supporting and educating the bedside nursing team, 2) external responsibilities of working in an ECMO referral ICU such as transports and retrievals, (3) beyond ECMO support and supporting other advanced cardiac support devices such as ventricular assist device and Impella, (4) care transitions from clinical deterioration to weaning, bridge-to-transplant, or end of life care, and (5) governance and service quality enhancement to ensure the provision of a “24/7” service.

Conclusion: The ECLS-APNT’s role and responsibilities are not limited to supporting the high-volume ECMO ICU, but also the external ECMO referrals service. Technological advancements in respiratory and heart failure requires a timely response from the ECLS-APNT throughout the hospital and health system.

Alfred Health Nursing Research

Is There a Relationship Between Hospital Readmission Post-Allogenic Stem Cell Transplantation and Return to Work? A Pilot Study Exploring Return to Work for People with Haematological Malignancies

Cirone, B, Tan, J, Spencer, A, Wright, T

Background: Individuals who return to work (RTW) full-time after allogeneic stem cell transplant (SCT) are more likely to report good-excellent quality of life compared to those who are unemployed. Further exploration of the factors impacting RTW for this group is warranted to enable targeted intervention and support.

Aim: To explore rates of RTW and the frequency and reasons for hospital readmission post allogenic SCT.

Method: This retrospective pilot study conducted at Alfred Health with ethics approval analysed a consecutive sample of patient data for individuals attending a Nurse-Led Haematology Supportive Care Clinic Program (NLHSCCP) following transplantation. RTW, readmission rates, length of stay (LOS) and reason for readmission were analysed.

Results: Between February 2024 and August 2025, n=31 patients attended the NLHSCCP. Most participants had acute leukaemia (45%) with a median age of 53 years. The average LOS for SCT admission was 31 days. Nineteen (61%) participants were readmitted, with 50 readmissions recorded within 15 months post-transplant and 12 (39%) participants required ≥ 2 readmissions. Reasons for readmission included infection (50%), fever of unclear cause (10%) and sepsis (10%). Fifty-five percent had graft versus host disease (GvHD) with 16% of participants living with ongoing GvHD. Of the 19 (61%) participants working full time prior to diagnosis, 2 (6%) were able to RTW full time by one-year post-transplant; 10 (29%) participants RTW part time and 6 (10%) were not working. Of the 6 (10%) participants not working, 4 (67%) had ≥ 3 readmissions within 12 months post-transplant. Those who did not RTW due to health accounted for 42% of total readmissions.

Conclusions: Patients following allogeneic SCT are at high risk for inability to RTW, due to multiple readmissions following transplantation. This pilot will inform the development of a model-of-care that incorporates a readmission prevention plan, including nurse-led education, to optimise transplant recipients' RTW as desired.

Alfred Health Nursing Research

Mapping Patient Outcomes Associated with Cardiac Rehabilitation: A Linked Data Analysis of 37,191 Patients from the Victorian Cardiac Outcomes Registry (2019 – 2021)

Cartledge S, Lucas M, Dinh D, Brennan A, Lefkovits J, Gauci S, Thomas E, Miranda PC, Livori A, Gallagher R, O'Neil A, Redfern J, Reid C, Driscoll A, Stub D

Aim: To determine cardiac rehabilitation (CR) attendance and outcomes of Victorian percutaneous coronary intervention (PCI) patients between 2019 – 2021. Previously we demonstrated that 84% of Victorian PCI patients are referred to CR but attendance was unknown.

Method: A retrospective, observational cohort study was undertaken through data linkage of the Victorian Cardiac Outcomes Registry (VCOR) and associated pre-linked data (including emergency and admitted episodes, national death index) to the outpatient Victorian Integrated Non-Admitted Health (VINAH) dataset for the first time. Multivariable logistic regression was used to identify factors associated with attendance. Tests to compare proportions/distributions were used to examine 12-month outcomes between attenders and non-attenders.

Results: During the study period 37,191 PCIs occurred, of which 7126 patients were represented in VINAH, with 7172 admitted episodes registered. 19.3% of patients attended CR, however, of these patients 19.9% attended one CR session. The strongest predictors of CR attendance were STEMI (OR 2.18, 95% CI 1.82-2.62, p<0.001), NSTEMI (OR 1.56, 95% CI 1.33-1.83, p<0.001), regional/rural CR location (OR 1.54, 95% CI 1.30-1.81, p<0.001) and length of stay >3 days (OR 1.21, 95% CI 1.04-1.41, p0.012). Those who attended CR were less likely to have a cardiac emergency department presentation (p <0.001), unplanned cardiac readmission (p=0.038) or die within 12 months (p <0.001). We observed a dose response relationship whereby those who attended >6 CR sessions had lower mortality over 12-months (p<0.001) compared to those who attended <6 CR sessions. Emergency Department presentations or unplanned cardiac readmissions at 12 months did not differ between the two dose groups.

Conclusion: It was feasible to link VCOR and pre-linked data to the VINAH dataset. Approximately one fifth of Victorian PCI patients attended at least one CR session. Benefits of CR attendance on health system use and mortality were observed in addition to a dose response relationship.

Alfred Health Nursing Research

Supporting the Shift: Inpatient Review of BCMA CAR-T Therapy in Multiple Myeloma Reveals Early Safety and Feasibility for a Nurse-Let Outpatient Model of Care

Ty Simpson, Sriyani Parsons, Christina Kazzi, Cassie Abbott, Jian Li , Ellen Heywood, Sueh-li Lim, Daniela Klarica, Shafqat Inam, Shu Min Wong, Miriam Wronski, Elizabeth Cole, Mastura Monif, Constantine Tam, Andrew Spencer

Introduction and Aim: BCMA-directed CAR-T therapy has improved outcomes in multiple myeloma but is traditionally inpatient due to toxicity risks. As 4-1BB products show delayed onset, outpatient monitoring may be feasible. This retrospective observational study reviewed incidence, timing, and severity of post-infusion toxicities and evaluated the safety and feasibility of a nurse-led outpatient model of care.

Methods: A retrospective consecutive review of 39 MM patients receiving BCMA-directed CAR-T was performed. Two high-risk patients (≥50% marrow infiltration and/or progressive disease despite bridging therapy) and two treated with Abecma® were excluded, leaving 35 patients for evaluation. Data was collected by the CAR-T data manager and included age, gender, ECOG, line of therapy, cytokine release syndrome (CRS) onset, immune effector cell-associated neurotoxicity syndrome (ICANS) onset, and ≥Grade 3 cytopenias within the first five days. Statistics assessed the incidence, timing, and severity of early complications within the first five days to inform feasibility and safety of a nurse-led outpatient model.

Results: The median onset of CRS was Day +7 (range Day +5 - 13), with ICANS also occurring at Day +7. No severe immune-related toxicities or cytopenias necessitating emergency presentation or unplanned admission were observed within the first five days post-infusion. Grade ≥3 cytopenias were identified early but were effectively managed with standard supportive measures.

Conclusions: Early complications post-BCMA CAR-T were infrequent and manageable, with CRS and ICANS consistently occurring on or after Day +5. A nurse-led outpatient model from lymphodepleting chemotherapy through Day +5, incorporating daily ambulatory reviews (blood tests, ICE scoring, neurological evaluations) coordinated by an Advanced practice nurse, has been successfully piloted, with four patients safely infused. Transition to admission on Day +5 enables high-risk monitoring during peak CAR-T expansion. This model has been accepted institutionally as the new standard of care, enhancing patient-centred delivery. It supports healthcare sustainability and will reduce hospitalisation by up to six days per patient.

Alfred Health Nursing Research

Reframing Myeloma Supportive Care: Nurse-Led Leadership to Improve Patient Outcomes

Klarica, D, Spencer, A, Wright, T

Introduction: The philosophy of our haematology supportive care nursing program is early engagement of patients in health promotion, autonomy for their health care and assessment of physical and psychosocial complications. We describe three examples of our multiple myeloma (MM) nurse practitioner (NP) supportive care program for individuals with a diagnosis of a plasma cell dyscrasia. These include two supportive care clinics (SCC); monoclonal gammopathy of undetermined significance (MGUS) and post autologous stem cell transplantation (ASCT) and the MM therapy at home program.

Methods: Individuals with MGUS are seen in the plasma cell disorder SCC at 3, 6 or 12 month time points. Individuals are seen in the post-ASCT SCC from discharge until 3 months. Demographic, disease and supportive care needs of individuals are collected at each clinic. Details on hospital readmissions in the first 12 months post ASCT were collected as well as number of MM treatments delivered at home since 2020.

Results: Between June 2016 and September 2025 there were 707 MGUS patient encounters in the MGUS SCC, patients were predominantly male (65%) with a median age of 65.5 years. Disease understanding was the most common unmet need in this cohort (75%). Between March 2023 and September 2025, 89 MM patients were seen in the post ASCT SCC. Patients were predominantly male (66.3%). There were 20 (22.5%) readmissions in the first 12 months post-ASCT due to varying infection complications. From 2019 a total 1075 MM cancer at home treatments were delivered.

Conclusion: These examples of our supportive care program in the plasma cell dyscrasia disease group demonstrate powerful collaborative nurse led programs. In the MGUS group an education gap has led to the development of a consumer endorsed education resource. Following MM ASCT identifying readmission causes will support the development of a re-admission prevention protocol. The leadership of the MM NP to identify opportunities for care at home has led to an improvement in quality of life of MM patients and reduced ambulatory treatment bookings.

Alfred Health Nursing Research

Perspectives of Carers on the Physical Health of Young People with Early Psychosis

Ting Ting Hui, Michael Olasoji, Lorretta Garvey

Preventable physical health conditions are the leading cause of premature death among individuals with mental illness, and established literature confirms the importance of early prevention, detection and intervention. The experience of carers navigating the mental health system for the first time with their loved ones experiencing early psychosis can be daunting and frightening. Left alone, they must find the right services and resources for physical healthcare or even determine what steps to take while accessing the mental health system.

Young people at risk of mental illness, at ultra-high risk of psychosis or experiencing early psychosis are particularly vulnerable to poor physical health due to the impact of psychosis on their psychosocial and functional well-being, as well as the complications associated with psychotropic medications. Carers play a crucial role in promoting the physical health of young people with early psychosis. The aim of the study was to explore the experiences of carers of young people with early psychosis regarding physical healthcare.

A qualitative study using an exploratory descriptive approach was conducted. Semi-structured interviews were conducted with twelve carers via Microsoft Teams. Major themes were identified using thematic analysis, with a key finding highlighting the disconnection between physical and mental healthcare for young people with early psychosis. Participants described feeling overwhelmed while navigating the youth mental health system to access physical healthcare.

The term 'suboptimal care' emerged in the findings, with carers emphasising that challenges in accessing physical healthcare stem from a lack of coordination and resources within the mental health system. Unaware of the available resources and how to access them, carers are often left to act as self-coordinators for their loved ones, attempting to piece together the fragmented system in an effort to secure the necessary physical healthcare.

Alfred Health Nursing Research

Identifying Clinical Communication Failures Through Machine Learning Analysis of Routine Patient Feedback

Nouman M, Chappel S.E, Ozavci G, McDonald C, Wallace S, Dahm M, Brough R, Redley B, Bucknall T

Effective communication is vital to safe, high-quality healthcare, yet communication failures remain one of the leading causes of patient dissatisfaction and adverse events. Applying machine learning (ML) to routinely collected hospital complaint data could identify communication failures to help target processes to enhance patient care.

Aim: To develop and validate an automated, ML model that classifies and triages patient complaints, enabling healthcare providers to proactively detect communication failures.

Methods: This single site, ML study involved analysing >13,000 retrospective patient complaints from Riskman data, routinely collected by the Patient Feedback and Liaison Office at Alfred Health between 2018 and 2024. A sample of 2,061 complaints, including 1,000 specifically related to communication, were divided into training (70%), validation (15%), and test (15%) sets to develop the ML model. The ML model was trained to (i) classify the complaint as clinical communication or other issues, (ii) categorise communication-related complaints into broader themes of respect & patient rights, listening, and communication, using keywords from the Healthcare Complaints Analysis Tool and Alfred Health's Patients Come First domains, and (iii) identify profession involved. To enhance the model's ability to detect specific communication failures, we further refined it by integrating multi-level, validated communication mechanisms/frameworks, enabling it to capture both verbal and non-verbal cues from data.

Results: The developed ML model achieved 97.04% accuracy, Cohen's Kappa of 0.9391, and F1-score of 0.9646. Validation checks confirmed the model's ability to provide reliable probability estimates, ensuring safe use in complaint triage workflows.

Conclusion: Our ML model provides a scalable, interpretable solution for real-time categorisation of patient complaints. This will prevent delays in reviewing complaints and facilitate early intervention to address communication failures, and patient experiences. Future integration with feedback dashboards could enable proactive monitoring and timely intervention, fostering continuous improvement in patient-centered communication and care.

Alfred Health Emerging Nursing Research

Factors Influencing Registered Nurses' Experiences When Precepting Nursing Students on Clinical Placement

Sam Miller, Ravani Duggan

The nursing workforce in Australia has seen a shift in skill mix with a greater percentage of newly qualified nurses. This change reflects global developments attributed to higher attrition rates after the Covid-19 pandemic. Despite a surge in recruitment, a worldwide nursing workforce deficit persists. It is therefore important that our existing nursing workforce are retained and that nursing students have a positive experience that supports their entrance into the profession. The aim of this integrative literature review was to identify factors that influence nursing preceptors' experiences when supporting students on clinical placement.

Methods: The integrative review followed the framework described by Whittemore and Knafl (2005). Four computerised databases were used to search for literature: Ovid, Scopus, Web of Science, and the Cumulative Index to Nursing and Allied Health Literature. The search focused on studies published between 2020 and 2024, excluding studies published prior to ensure results were representative of the post-COVID-19 pandemic nursing context. Articles with a population undertaking an entry-to-practice qualification in nursing at either a Bachelors or Masters level were included.

Results: The major themes of (1) clinical practice environment, (2) student-preceptor specific factors, and (3) preceptor-dependent factors emerged. Theme 1 comprised the subthemes of (a) challenges and demands, and (b) expectations and responsibilities. Theme 2 contained the subthemes of (a) relationship building and communication, and (b) mutual engagement and commitment. Theme 3 spanned the sub themes of (a) balancing professional roles, and (b) self-discovery and growth.

Conclusion: Preceptorship is valuable in the supervision and education of student nurses undertaking clinical placement. Good collaboration between placement and education providers is needed to ensure appropriate preparation of preceptors. Positive interpersonal interactions with students influence preceptors' satisfaction with the preceptor role. The role of preceptor is valuable for the professional development of RNs, despite the reported challenge of adding to the workload.

Alfred Health Emerging Nursing Research

Organ Donation in Burns Patients: A Retrospective Analysis of Outcomes in The Alfred ICU

Georgie Callaghan, David Pilcher, Freya Parrotte, Alex Simpson, Josh Ihle, Laura Fleckner, Anna McNamara

Introduction: Severe burn injuries were once considered a barrier to organ donation due to concerns around tissue viability and recipient outcomes. Developments in critical care management and embedding of Best Practice for organ donation have improved the potential for successful outcomes.

Aim: This study aims to analyse the outcomes of organ donation among patients with burn injury admitted to the Alfred ICU from 2014 to 2023.
Methods: A retrospective analysis was conducted using deidentified data from Alfred ICU, burns registries, and organ donation databases, including ANZICS and the Organ and Tissue Authority. The focus was on patients transitioning to end-of-life care and undergoing organ donation evaluation.

Results: Out of 661 patients admitted to ICU with burns, data was available for 73 of the 74 patients who died in ICU. Of the 68 patients referred to DonateLife Victoria, 30 were deemed medically suitable for donation. Family consent for organ donation was obtained from 18 patients, resulting in 18 actual organ donors. Organ retrieval included 30 kidneys (25 transplanted), 4 livers (3 transplanted), 3 lungs (3 transplanted), 1 pancreas (1 transplanted), and 1 heart (not transplanted).

Conclusion: Burns patients, once considered unsuitable for organ donation, can contribute to transplantation with favourable outcomes for recipients. While the limited sample size imposes constraints on the generalisability of our findings, the positive outcomes observed among recipients are encouraging. These findings warrant further exploration into optimising referral and donation processes in this patient population.

Alfred Health Emerging Nursing Research

Nurse-Supported Sedation for Transcatheter Aortic Valve Implantation (Tavi): A Propensity-Matched Study

Kilner, J[1], Gardner, E[1], Nanayakkara, S[123], Martin, L[1]

Background: High-volume structural heart (SH) centres face restrictions due to limited cardiac catheterisation laboratory (CCL) availability and anaesthetic resource allocation. Nurse-supported sedation for transcatheter aortic valve implantation (NAVI) presents an alternative, optimising procedural efficiency and expanding patient access to aortic valve interventions.

Aim: To evaluate the quality and safety of NAVI as an alternative to traditional anaesthetist-supported TAVI.

Method: A retrospective analysis compared 68 NAVI patients with 201 TAVI patients before propensity score. Baseline characteristics were naturally well-balanced, with no significant differences in age (81 [76–86] years, p=0.6), gender (female: 43% vs. 44%, p=0.9), and STS score (3.7 [2.1, 5.9] vs. 3.8 [2.1, 5.9], p>0.9).

Results: Patients undergoing NAVI had shorter wait times (median: 28 [7, 41] vs. 30 [20, 58] days, p=0.004), and lower doses of fentanyl (median: 75 [50, 100] vs. 75 [50, 100] mcg, p=0.045) and midazolam (median: 1.00 [1.00, 1.00] vs. 1.00 [1.00, 2.00] mg, p=0.004). Rates of same-day ambulation were higher in the NAVI group (38% vs. 30%, p=0.003), while hospital length of stay was similar between groups (70 [46, 100] vs. 58 [48, 99] hours, p=0.8). Complication rates were comparable, with no significant difference in arrhythmia requiring pacemaker insertion, vascular complication or acute kidney injury (p=0.7). Propensity matching further confirmed these findings, with no significant changes in key clinical variables.

Conclusion: NAVI is a safe and effective alternative to anaesthetic-supported TAVI in high-volume SH programs, optimising CCL utilisation while maintaining comparable clinical outcomes. Further research should evaluate long-term outcomes and patient-reported experiences with NAVI.

Alfred Health Emerging Nursing Research

The First 100 Patients: Evaluating the Impact of a Nurse-Led Strucutral Heart Clinic on Post-Tavi Patient Care

Ellen Gardner, Rozanne Johnston, Elisha Gartner, Jillian Pedetti, Josephine Amuso, Kate Lynch, Tony Walton, Samer Noaman, Nay Htun, Sonny Palmer, Dion Stub, Shane Nanayakkara

Aim: This study evaluates the impact of a nurse-led post-transcatheter aortic valve implantation (TAVI) clinic on access to timely follow-up, program efficiency, and patient management in a high-volume Structural Heart (SH) program. As aortic stenosis becomes more prevalent in the aging population, SH programs face increasing demand for outpatient follow-up. Advanced Practice Nurses (APNs) specialising in valvular heart disease are ideally positioned to enhance patient care, optimise resource utilisation, and improve program efficiency.

Method: A retrospective review was conducted on the first 100 post-TAVI patients managed within a nurse-led clinic at a large public hospital. Using electronic medical records (EMRs), the time from the TAVI procedure to the initial post-discharge general cardiology clinic review and subsequent SH specialist review was measured. These time intervals were compared to the direct-to-nurse-led clinic pathway, which bypassed sequential specialist reviews.

Results: Before implementation, post-TAVI patients waited an average of 83 days for general cardiology review and 180 days for SH specialist follow-up. The nurse-led clinic reduced the wait time to an average of 55 days. Of the 100 patients reviewed, 5 required further diagnostic testing, 7 needed medication adjustments and 5 required onward referrals to specialist. Early identification of clinical concerns allowed streamlined communication with the SH team and primary care practitioners, enhancing continuity of care.

Conclusion: The nurse-led post-TAVI clinic significantly reduced follow-up wait times and improved SH program efficiency. APNs play a crucial role in optimising outpatient care, ensuring timely follow-up, and supporting SH program efficiency. Further research will be conducted to evaluate patient safety and experience.

Alfred Health Emerging Nursing Research

V.E.I.N.S.: Vital Education Improving Nursing Skills for PIVC practices

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Peripheral intravenous catheters (PIVCs) are widely used invasive devices associated with preventable complications, including bloodstream infections. Assessment and documentation of PIVC care are critical to preventing PIVC-related infections and aligns with the national Management of PIVC Clinical Care Standard (CCS).

Aim: To evaluate the impact of targeted, multimodal education on PIVC practices amongst nursing staff.

Methods: This project took place over a three-month period (April-June 2025) on 4WA and consisted of three phases: (1) Baseline auditing of all patients on the ward with a PIVC in situ using a REDCap survey of PIVC documentation practices, appearance of the patient's PIVC, and asking the patient if they had received PIVC education; (2) Implementation of a multi-modal education plan over 4 weeks, including twice-weekly 30-minute PIVC education sessions, SMIT (six-minute intensive training) sessions during double staffing prior to handover, and attaching laminated reminders to the top of the bedside monitor on wheels (BMWs); and (3) Repeating the patient audit performed at baseline, and additionally an anonymous staff survey regarding their confidence and learnings post the educational intervention.

Results: A total of 148 PIVCs were audited over the eight-week period (73 baseline and 75 post-intervention). Results highlighted significant improvements in documentation of PIVC care including documenting phlebitis assessments (53% compared with 13% at baseline), dressing conditions (56%, up from 21%), and a significant reduction in the number of PIVCs exceeding recommended dwell time (7% compared to 28% at baseline).

21/28 staff completed the survey, with 80% reporting learning something new and 95.2% staff felt very confident or confident caring for PIVCs (compared with 66.7% prior to education).

Conclusion: PIVC documentation substantially improved compliance and knowledge. Improving documentation compliance is intended to support nursing staff in managing PIVCs in accordance with the CCS. This project plans to expand to cardiac and cancer inpatient settings.

Alfred Health Emerging Nursing Research

Innovating Chest Pain Care: A Clinical Nurse Consultant Provided Model for Timely Assessment & Management

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Implementation of a Clinical Nurse Consultant (CNC) Provided Model for Timely Assessment of Noval Chest Pain Patients, to improve efficacy for patients regarding wait times, management plans and outcomes compared to a traditional medical pathway.

Aim: Implement and evaluate a CNC provided model for timely chest pain assessment for patients referred with novel chest pain. CNC's triage referrals, conduct clinical assessments and in collaboration with cardiologists, order investigations and develop individualised management plans. This approach aims to improve patient care and clinical safety, streamline discharge pathways and reduce inefficient outpatient appointments.

Method: A CNC-provided model for chest pain assessment was implemented by appointing two Cardiac CNC's (1EFT) to conduct daily Telehealth Clinics. These clinics accommodate 20 initial consultations per week, with 40-minute appointments, 8 telephone review appointments per week and include a designated cardiologist for case review. Administrative staff assist with scheduling and collation of investigation reports.

Results: The Nurse-provided model improved clinical safety by ensuring an initial assessment within 30 days of referral. Average time from referral to first consult decreased from 91 days to 21 days. The model significantly reduced waiting times for investigations, with designated clinic stress echo and CTCA slots and specialist reviews. In collaboration with Cardiologists, the nurse-provided clinic initiated timely management plans, significantly enhancing efficiency compared to the traditional medical-led pathway.

Conclusion: Implementing a CNC-provided chest pain assessment model improved patient care, efficiency and clinical safety. By ensuring timely initial assessments, expediting investigations and management, this approach optimized resource utilisation and minimised clinical risk. The findings support the integration of nurse-provided models to improve outpatient cardiology services by decreasing wait times for patients, enhancing clinical safety, and increasing the efficiency of outpatient appointments. No major adverse cardiac events have been reported during the 12 months the clinic has been established.

Alfred Health Emerging Nursing Research

Evaluating Patient Presentations for Care Delivered by Emergency Nurse Practitioners in an Urban Emergency Department: A 5-Year Retrospective Chart Audit Analysis

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Background: Emergency departments in Australia face rising demand, workforce shortages, and overcrowding. Emergency nurse practitioners (ENPs) have developed as part of innovative workforce models that work alongside medical staff to enhance timely and efficient care. Despite widespread adoption of ENPs, there has been limited robust evidence of operational outcomes and care quality, highlighting the need for rigorous, context-specific evaluation to support sustainable implementation.

Objective: To describe the demographics, clinical presentations, and operational outcomes of patients managed by ENPs in a tertiary ED over five years.

Methods: We conducted a retrospective cross-sectional review of all adult patients (≥18 years) managed by ENPs at the Alfred Emergency and Trauma Centre, between January 2019 and December 2023. Data included demographics, Australasian Triage Scale, time to be seen, length of stay, National Emergency Access Target compliance, discharge diagnoses, referral and admission specialties, and disposition. Medians with interquartile ranges were reported for skewed variables, and frequencies with percentages for categorical variables.

Results: ENPs managed 26,348 presentations during the study period. Median patient age was 42.9 years (IQR 22–64). Presentations spanned all ATS categories, with Category 4 the most common (62.0%). Median time to be seen was 33.9 minutes (IQR 13–44), and median length of stay was 209 minutes (IQR 109–225). ENPs managed 1,682 different discharge diagnoses, consolidated into 320 categories covering both injury and illness. The most frequent referrals were to Plastics (35.0%), Orthopaedics (17.8%), and Surgery (16.8%).

Conclusion: This is the largest single-site review on operational outcomes of ENPs in Australia. ENPs safely and efficiently manage a broad spectrum of ED presentations, provide timely assessment, and support patient flow through close collaboration and integration within the ED and specialty medical teams. This study strengthens evidence for ENPs as essential contributors, alongside their medical colleagues, to sustainable ED care delivery.

Alfred Health Emerging Nursing Research

Comparison of Microwave and Radiofrequency Ablation for the Treatment of Hepatocellular Carcinoma: Nursing Considerations in Thermoprotection Techniques

Dominic Buensalido

Purpose: Percutaneous ablative therapies, such as RFA and MWA, are safe and effective for early-stage HepatoCellular Carcinoma. This study compared the safety and efficacy of RFA versus MWA over a 13-year period, highlighting the role of nursing-professionals in assisting with Thermoprotection Techniques (TTs).

Methods: A retrospective study of RFA and MWA performed between 2010-2023 on patients with early-stage HCC was conducted. Nursing-professionals assisted with the TTs, artificial ascites and pleural effusion, to prevent collateral thermal injury to vital organs in the proximity of the treated tumour/s. Rates of major complications and residual disease at 1,3, and 6 months post-procedure were analysed, with subanalysis by lesion size (<30mm,30-40mm,>40mm).

Results: The study included 142 patients with 291 lesions (71% RFA, 29% MWA). Bleeding-rates were RFA 1.9%, MWA 4% (p=0.231). Infection-rates were RFA 0.5%, MWA 0% (p=1.000). Other complications occurred in 1.4% of RFA and 1.2% of MWA cases (p=1.000). TTs were refined by the nursing professionals, applied when vital organs were <10mm from treated tumour/s and protocols were implemented.

At 1-month, residual disease was 16% for RFA and 4% for MWA (p=0.008). At 3 and 6 months, differences were not significant (p=0.586 and p=0.317). For lesions <30mm, RFA showed 17% residual disease, while MWA showed 5% (p=0.019). No significant differences were seen for larger lesions or later follow-ups.

Conclusion: MWA appears to be safer and more effective than RFA for treating early-stage HCC, with lower complication and residual disease rates. Thermoprotection is an essential component for the safety profile of thermal ablation.

Alfred Health Emerging Nursing Research

Title: Non-pharmacological pain management for emergency surgery & trauma patients

Olivia Sonneborn, Gulzar Malik, Christine East

Acute pain from traumatic injury or emergency surgery is intense, enduring and severely interferes with patient's mobility and ability to undertake daily activities. Non-pharmacological (NP) approaches for acute pain management can reduce the required dose and lower the risk of potential adverse side effects of pharmacological therapies. Patients and nurses play a central role in implementing non-pharmacological therapies.

NP approaches are one of the least studied areas of acute pain management in patients undergoing emergency surgery and following traumatic injuries.

Aim: To synthesize existing research on the perceptions of patients and nurses of non-pharmacological methods for acute pain management following traumatic injury and emergency surgery.

Methods: The scoping review followed the methodology guided by the Joanna Briggs Institute and the Population, Concept, and Context (PCC) framework to explore 13 studies.

Results: A total of twenty-four (n=24) different non-pharmacological methods were discussed across the 13 Australian and international articles in this scoping review. Patients most frequently used touch/massage (n =6) and music (n=5) non-pharmacological approaches and nurses most frequently initiated education (n=3) and music (n=3) non-pharmacological approaches for patients. Patients identified shared decision-making and involvement in their acute pain management plans as important. Nurses perceived non-pharmacological approaches as beneficial to acute pain management; yet identified external barriers to more frequent use of NP pain management for trauma and emergency surgery patients. Barriers include lack of knowledge, workload and time restrictions.

Conclusion: Non-pharmacological analgesia is effective in reducing acute pain, and patients prefer and appreciate a combination of pharmacological and non-pharmacological analgesic management following trauma and emergency surgery.

Alfred Health Emerging Nursing Research

Exploring the Influence of Emotionally Intelligent Leadership on the Wellbeing and Retention of Mental Health Nurses

Johnson, W, Bucknall, T, Alexander, L

Amidst critical global nursing shortages, retaining mental health nurses (MHN) in Australia is crucial to continue providing high-quality care. MHN frequently encounter physical and verbal violence, however their professional quality of life is more influenced by job stress than by workplace violence. Emotionally intelligent (EI) leadership in healthcare has been shown to positively impact nurses' job satisfaction, wellbeing, and intention to remain in their roles. Previous research, however, has not explored how it affects the unique challenges faced by MHN.

Aim: To understand MHN experiences of EI leadership, and the impacts these experiences have on their wellbeing and turnover intention.

Method: This qualitative descriptive study employed semi-structured interviews with registered nurses from Alfred Mental and Addiction Health program. Transcripts were verified for accuracy by the research team and participants. Data were assigned codes and deidentified, with Qualtrics software to collect demographic data. The interview guide was developed with the five components of EI - self-awareness, self-regulation, motivation, empathy, and social skills - focused on MHN experiences of these leadership qualities. Thematic analysis following Braun and Clarke's six-step method was employed to identify and examine recurring patterns within the data, and to draw detailed conclusions.

Results: EI leadership significantly influences MHN experiences, highlighting nurses' personal narratives and revealing specific examples of positive leadership that enhances job satisfaction and retention. Three themes were identified: (1) Qualities, Characteristics and Behaviours of Leaders; (2) Nurses' Experiences of Leadership; (3) Organisational Implications.

Conclusion And Clinical Implications: These insights provide valuable knowledge for healthcare organisations to develop EI-focused leadership training programs aimed at improving staff morale, patient care, and reducing turnover. The study's insights also further contribute to the evidence-base highlighting the direct correlation between EI-informed nursing leadership and staff retention and is useful in sustaining and supporting the increasingly under stress mental health workforce.

Alfred Health Emerging Nursing Research

A mixed methods study to identify Australia's top 10 research priorities for perioperative medicine

Short title: Perioperative Medicine Research Priorities in Australia

Sophie K. A. Wallace, Tracey K. Bucknall, Andrew Forbes and Paul S. Myles,

Perioperative medicine plays a critical role in improving surgical outcomes, yet research efforts are often fragmented and not aligned with the needs of patients, clinicians, and health systems. To address this gap, we conducted a national mixed-methods study to identify the top 10 research priorities for perioperative medicine in Australia.

Using an adapted James Lind Alliance methodology, we partnered with patients, carers, clinicians, and researchers to ensure broad and meaningful engagement. Surveys were distributed via clinics, social media, professional networks, and consumer advocacy groups, inviting participants to submit their most pressing questions about perioperative care. Responses (n=544) were thematically analysed and cross-referenced with existing evidence to identify true uncertainties. A subsequent national priority-setting survey (n=100) and a structured consensus workshop, facilitated by the Health Issues Centre, enabled a diverse group of consumers and health professionals to refine and agree on the final list of priorities.

The resulting priorities reflect urgent clinical and system-level challenges, including equitable access to information for culturally and linguistically diverse patients, improved preoperative decision-making, strategies to reduce surgical infections, enhanced patient-centred care, prehabilitation approaches, optimisation of analgesia, and reliable prediction of perioperative risk. Importantly, more than half of initial respondents were consumers, ensuring the final priorities were deeply informed by lived experiences of surgery.

This project represents the first nationwide priority-setting partnership for perioperative medicine in Australia. By incorporating diverse perspectives, it highlights critical knowledge gaps and ensures future research is patient-centred, equitable, and relevant to end users. The findings provide a clear roadmap for researchers, funders, and policymakers, with potential to reduce research waste, maximise impact, and ultimately improve outcomes for the 2.6 million Australians undergoing surgery each year.

Alfred Health Emerging Nursing Research

Hidden Figures: Uncovering the Hidden Patient Numbers in Managing Structural Heart Programs

Rozanne Johnston, Lorelle Martin, Ellen Gardner, Elisha Gartner, Jillian Pedetti, Antony Walton, Samer Noaman, Nay Htun, Sonny Palmer, Dion Stub, Shane Nanayakkara

Aim: Structural heart (SH) programs typically measure resource needs by annual procedural volumes, but this overlooks a significant patient population undergoing extensive assessment without proceeding to intervention. This study aimed to quantify the total patient load across all stages of SH care to better reflect program resourcing requirements.

Methods: Using a custom digital patient management system, all referrals for elective and urgent SH interventions, including aortic, mitral, tricuspid valve, and closure procedures, were tracked from 2019 to 2025. Data encompassed completed procedures and patients removed prior to intervention, with removal reasons categorized as medical therapy, valvuloplasty, surgical referral, death, or other factors such as lost to follow-up. Key care stages identified included investigational workup, multidisciplinary assessment, and waitlisting.

Results: Over the study period, 2257 patients were referred, resulting in 1509 SH procedures, dominated by 79.5% aortic valve interventions. Urgent inpatient cases accounted for 16.9% of completed procedures. Removals prior to intervention accounted for 656 (30.3%) patients, also dominated by aortic valve interventions at 68.9% of the removals. Mitral and tricuspid referrals showed higher removal than completion rates. Removal rates increased annually, from 10.4% in 2019 to 31.1% in 2024. A 2025 snapshot revealed 93 patients actively undergoing assessment, indicating substantial ongoing resource utilization. Medical management was the leading cause for removal (42.4%), while deaths prior to procedure were least common (5.3%). Surgical referrals accounted for 21.7% of aortic, 9% of mitral, and 8.3% of tricuspid patients removed.

Conclusion: This study demonstrates that procedural counts alone underestimate SH program workload. Incorporating stage-based patient counts captures non-procedural care activities, urgent inpatient coordination, and removals, providing a more accurate metric for staffing and capacity planning. As valvular heart disease prevalence and program volumes rise, these comprehensive metrics are essential for optimizing Heart Team resources and ensuring efficient, safe patient access.

Alfred Health Emerging Nursing Research

The Impact of Cusp Overlap View on Permanent Pacemaker Insertion Rates Post Self-Expanding Transcatheter Aortic Valve Implant: A Retrospective Analysis of ACE TAVI Data

Pedetti J, Gartner E, Johnston R, Gardner E, Nanayakkara S

Aim: This retrospective study compared procedural outcomes and permanent pacemaker (PPM) implantation rates within 30 days between two implantation techniques for self-expanding transcatheter aortic valve implantation (SEV TAVI): (1) cusp overlap and (2) coplanar. The cusp overlap technique is a standardised approach designed to optimise implantation depth and potentially reduce PPM risk.

Methods: We conducted a retrospective cohort study of patients without prior PPM who underwent SEV TAVI between 2018 and 2024 across three tertiary hospitals in Victoria. The cusp overlap technique was introduced in August 2020. To minimise the impact of procedural learning curves, patients treated during 2020 were excluded, and outcomes were compared before and after implementation. Statistical analyses assessed differences in 30-day PPM implantation, valve recapture rates, and procedural duration.

Results: A total of 1,684 patients underwent SEV TAVI, of whom 205 (12%) required a PPM. The PPM cohort had a mean age of 83 years and were predominantly male (61%). Overall, 78% of patients were treated with the cusp overlap technique. 30 PPM implantation rates were similar between cusp overlap and coplanar groups (11% vs. 12%). Mean procedural duration decreased modestly with cusp overlap (72 minutes vs. 78 minutes). However, valve recapture rates were significantly higher in the cusp overlap group (32% vs. 20%).

Conclusion: Adoption of the cusp overlap technique did not significantly reduce PPM implantation rates compared with the coplanar approach, though a small reduction in procedural time was observed. The technique was associated with higher valve recapture rates, suggesting potential procedural trade-offs. Further research is warranted to optimize implantation strategies and mitigate conduction disturbances following SEV TAVI.

Alfred Health Emerging Nursing Research

Safety of "Sip 'Til Send" Fasting Protocol on Patients for Interventional Radiology Procedures

Profeta R, Subramaniam S, Goh G

Background: Strict fasting from food and liquid for a minimum of 4 hours has been an essential requirement before an elective procedure that requires conscious sedation or general anaesthesia in Interventional Radiology (IR). Recently, many Australian and New Zealand hospitals have started to practice a modified 'Sip til send' fasting protocol supported by the Australian and New Zealand College of Anaesthetists (ANZCA). This involves patients fasting from solids for 6 hours and being able to drink up to 200mls of clear fluids until the time they are sent for a procedure. Although the risk of aspiration varies between patients who are airway protected with an endotracheal tube versus those without airway protection in conscious sedation, the benefits of the modified fasting regimen are comparable.

Aim: To assess the safety of the modified fasting protocol "sip 'til send" on patients who underwent an interventional radiology procedure and were administered conscious sedation or general anaesthesia.

Methods: A retrospective review of all patients who were given general anaesthesia and conscious sedation from November 25, 2024, to March 30, 2025. Patient data were collected from the Radiology Information System (RIS) and Electronic Medical Record (EMR). Procedure type, patient demographics and any peri-procedural or immediate post-procedural sedation-related complications, such as vomiting and aspiration, were checked if recorded or reported in RISKMAN.

Results: A total of 232 patients who underwent interventional radiology and were given conscious sedation or general anaesthesia had no recorded perioperative and post-procedural sedation, vomiting or aspiration. The participants were aged between 19-94 years old, comprising 130 males and 102 females. 190/232 participants (82%) were given IR-led conscious sedation, and 42/232 participants (18%) were under anaesthetic support and monitoring.

Conclusion: This study has shown that the modified "Sip 'til Send" policy is a safe fasting option for Interventional Radiology patients undergoing conscious sedation or general anaesthesia.

Alfred Health Emerging Nursing Research

Guess who's back? Characterising trends and DRG drivers for readmissions in general medicine

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Aim: To explore the frequency, trends, and diagnosis-related groups (DRGs) associated with 7-day and 28-day all-cause unplanned readmissions in general medicine.

Methods: A time-series analysis was conducted using administrative databases across 3 hospitals with general medicine services at Alfred Health, Victoria. All-cause unplanned readmissions within 7 and 28 days of discharge from index admissions between 1st July 2023 and 30th November 2024 were evaluated. Trends were analysed using run charts and statistical process control charts. DRGs of index admissions were matched against those of readmissions at patient level.

Results: A total of 11553 index admissions were identified. 1559 (13.5%) were readmitted within 28 days of discharge, and of these 674 (43.2%) occurred within 7 days. Monthly trends for index admissions, 7- and 28-day readmissions, and for the top 5 major diagnostic categories of readmissions mostly remained within common cause variation. Top DRGs were similar for 7- and 28-day readmissions at an aggregate level, which included heart failure and shock, alcohol intoxication and withdrawal, respiratory infections and inflammations, and other digestive system disorders. Approximately 25% of unplanned 7- and 28-day readmissions had DRGs matching those of index admissions, with the most common DRGs being respiratory and circulatory system-related.

Conclusion: This study provides high-level understanding of the characteristics, trends, and DRG drivers of unplanned readmissions to general medicine. A significant proportion of 28-day readmissions occurred within 7 days, indicating this as the target group to reduce readmissions. Distribution of DRGs provided further signals on specific diagnoses that could be targeted to optimise care. Readmission DRGs were predominantly unmatched to index admissions, prompting explorations of other patient- and system-level drivers for readmissions. Cost evaluation, with sensitivity analyses, will be conducted to estimate the readmission-related financial impact and net benefits that can be incurred from improvement initiatives to reduce unplanned readmissions.

Alfred Health Emerging Nursing Research

Navigating Uncertain Futures

Felice Borghmans

Aim: Patients nearing end of life (EOL) who wish to continue life prolonging therapies (active treatment) face barriers to receiving care at home, especially access to community palliative care, resulting in a notable service gap. This project aimed to address this gap by integrating person-centred EOL care alongside active treatment into the General Medicine Hospital in the Home (Gen Med HITH) program.

Methods: A quality improvement method was undertaken in collaboration with the Palliative Assessment and Treatment Service (PATS), General Medicine physicians with palliative care expertise, and the Complex Care Program (CCP). A community-based EOL care guideline was developed through consultation with clinical experts and stakeholders. PATS provided clinical mentorship, targeted education, specialist consultation, case-based teaching, debriefing to Gen Med HITH clinicians, and more.

To enhance workforce capacity, all Gen Med HITH nurses completed training modules and workshops via the Commonwealth's Program of Experience in the Palliative Approach (PEPA). Additionally, two nurse champions completed PEPA clinical placements, gaining practical experience alongside specialist palliative care clinicians. A "step-up, step-down" care model was implemented with the CCP to allow flexible adjustment of care intensity, particularly for patients receiving maximal therapy approaching EOL.

Results: Since March 2023, seven patients have received integrated palliative care through the Gen Med HITH model. This approach effectively combined active treatment with comprehensive EOL care, respecting patients' values and preferences and addressing palliative needs within the community. Post- implementation clinician surveys indicated that EOL care has become an accepted and better- understood component of practice, with staff reporting increased confidence, competence, and support.

Conclusion: The growing prevalence of chronic disease and an ageing population necessitate adaptable EOL care delivery models. Integrating person-centred EOL care with active treatment in the HITH setting offers a sustainable and responsive approach that is aligned with contemporary healthcare demands and notions of value-based care.

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