WESTERN NSW HEALTH RESEARCH NETWORK

WHRN2025

Building Research Networks: Collaborative Approaches to Rural Health Research

ABSTRACT BOOKLET

DAY 2: RESEARCH SYMPOSIUM SCIENTIFIC PROGRAMME – CONCURRENT SESSIONS

CONCURRENT SESSION 1 – MORNING

Older rural people

OR1 - What makes us Sing Out? The essential elements of a regional, inclusive dementia choir. (General)

** WINNER OF BEST GENERAL RESEARCH ABSTRACT **

Mrs Elsie de Klerk

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Background and Aims: Social connection and inclusive activities enhance the quality of life for people with dementia and their carers. However, individuals in rural areas face additional barriers to accessing such opportunities and specialised support services. While existing research predominantly focus on metropolitan settings, little is known about inclusive choir experiences in rural and regional areas. The Dubbo-based Sing Out Choir was established in 2022, addressing a pertinent need for inclusive social activities for people living with dementia and their carers in the region. Supported by a vibrant leadership team and dedicated volunteers, the choir brings together over 170 participants weekly for joyful singing, dancing and individual performances. Regular concerts are a highlight for all involved. The study was conducted by researchers from NSWLHD, Charles Sturt University and Three Rivers Department of Rural Health, and explored the experiences of participants and facilitators of the Sing Out choir. Ethics approval was obtained via the Greater Western Human Research Ethics Committee (2024/EHT000328).
Methods: A qualitative approach was employed, involving focus groups with 25 current members: People living with dementia (n=8), carers (n=8), volunteers (n=6) and choir staff (n=3). Audio transcripts were transcribed and analysed using inductive thematic analysis.
Results: Participants reported overwhelmingly positive experiences, expressing strong hope for the choir's continuation despite funding and logistical challenges. Four key themes were identified: Overcoming initial reluctance to join the choir The choir as a place of inclusiveness and belonging Benefits of choir participation The complexities of establishing and sustaining an inclusive choir.
Conclusion and implications: Participation in the Sing Out choir provided meaningful benefits and personal fulfilment for people living with dementia, their carers, volunteers and staff. Local champions played a crucial role in member recruitment and program sustainability. Recommendations include reframing the term "dementia choir" to reduce stigma and considering training and support options for volunteers. These findings highlight the valuable contribution of inclusive community activities in regional settings.

OR2 - Dementia and Cognitive Impairment in the Farming Community. A Qualitative Study of Carers Perceptions of Risks/Barriers to Care. (Student)

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Background and Aims: Dementia is common and has a high burden of disease in society. In rural Australian settings, unique barriers often impact patients, with primary care falling to family members and other voluntary carers. The aim of the project was to explore the perceptions of informal carers of farmers living on-farm with dementia and cognitive impairment, in relation to risks and barriers.
Methods: Seven semi-structured telephone interviews took place between June and July 2025with carers of dementia patients living on farms. Their perceptions were recorded and analysed using an iterative thematic analysis.
Results: Six themes were noted in the interviews; 1) Geographic isolation; 2) Physical hazards and Farm responsibilities; 3) Interpersonal relationship conflict; 4) Inadequate government support; 5) Lack of local healthcare resourcing; and 6) Positive aspects of the farm environment.
Challenges: Recruitment was challenging, with several mediums used. Nature of participants farming background and environments differed, leading to some oppositional opinions.
Conclusion: A combination of factors leads to both risks and barriers to care as perceived by carers of farmers with dementia.

OR3 - Understanding Fall-Related Injuries in Older Australian Farmers. (Student)

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Background: Farmers have various physical and psychosocial factors predisposing them to falls. As farmers continue to work past the typical retirement age, their age-related risk factors for falls are also increased. Despite this, there is no available data for fall-related injuries in older Australian farmers. Aims This research aims to determine the 10-year prevalence rate of falls in farmers aged 60+, to present the agencies, nature, body location and economic impact of these falls, and to compare rates and economic impact against All Industry workers in Australia.
Methods: We used a retrospective Cross-sectional study of the Safe Work Australia National Data Set for Compensation-based Statistics Claims Dataset from 2012-2023. Farmers, farm managers and farm workers aged 60+ were selected for and all other workers were classified as 'All Industries' workers. Australian Labour force and Australian Bureau of Statistics data was used to determine the total number of Agricultural workers and All Industries workers. Descriptive statistics were used to present the data.
Results: The average yearly rate of falls in farmers aged 60+ between 2012-2023 was 59 (95% CI 46.75 to 73.13) per 100,000 workers and 285 (95% CI 275.58 to 293.73) for All Industries workers aged 60+. The total falls in this time-period for older farmers was 885 and 42,042 for older All Industries workers. The median compensation was relatively similar, but the median time lost (weeks) was generally longer in older farmers (10.9 weeks vs 9.3 weeks, respectively). Environmental agencies were the leading agency for falls (57%). Traumatic joint/ligament and muscle/tendon injury were the leading nature of injury for falls (41%) and the lower limbs (39%) were the most affected body location.
Conclusion: Elderly farmers fall at lower rates to elderly All Industry workers despite farmers (all ages) having higher rates of falls than All Industry workers (all ages).

OR4 - Factors Influencing End-of-life Care for Patients aged 75 years or older Admitted to the Intensive Care Unit (ICU) in a Regional Australian Hospital. (Student)

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Background: The ICU provides physical and emotional support to critically ill patients and their families. As Australia's aging population grows in regional areas, demand for medical services is increasing. End-of-life care is a key concern for older Australians, yet studies show their preferences are often not formally documented, leading to life-prolonging treatments that may not align with an individual's true wishes. Aim: To ascertain patient specific characteristics of those aged 75 years or older, who were admitted to and died in the ICU of Dubbo Hospital between December 2022 and December 2024.
Methods: We completed a retrospective audit of patient files from Dubbo Hospital Electronic Medical Records (EMR) and Intellispace Critical Care and Anaesthesia (ICCA) systems via patient Medical Record Numbers provided by the Western NSW Local Health District (WNSWLHD) Strategic Reform, Planning & Partnerships Directorate. Inclusion criteria included patients aged 75 years or older who were admitted to and died in the ICU of Dubbo Hospital between December 2022 – December 2024. Analysis involved descriptive statistics.
Results: Patients (N = 46) had a mean age of 82.3 years, with an approximate 2:1 male: female ratio. On average, the population had 6.1 chronic conditions and were on 7.4 medications at the time of admission to hospital. The most common reason for hospital admission was respiratory in nature (n=17, 37%). Only one individual out of 46 (2%) in the study population had an Advanced Care Plan (ACP) or Advanced Care Directive (ACD) uploaded to their EMR prior to admission. Average duration, from time of admission to ICU to time of death, was 6.3 days (SD 6.7). Most end-of-life care planning discussions occurred on the day of the patient's death (n=24, 52%), between the treating physicians and the family of the patient (n=20, 44%), meaning that most patients themselves were unable to participate in their own end-of-life care planning conversations.
Conclusion: In the regional Australian context, completion of end-of-life care documentation remains low. Having a definitive understanding of patient end-of-life preferences may prevent unnecessary admission to and death in the ICU. Formally documented end-of-life plans are essential in ensuring appropriate admission to the ICU, thus optimising resource provision and ensuring individual patient preferences are achieved. Further research into barriers faced by patients and physicians could help to inform best practice and support protocols for completing end-of-life documentation.

OR5 - Person-centred care, power, and organisational culture in aged care in rural and regional Australia (Emerging)

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Background: Ensuring high-quality nursing practice in aged care facilities is critical to the wellbeing of older people, particularly in rural and regional communities. The 2021 Royal Commission into Aged Care Quality and Safety identified organisational and workplace cultures as key contributors to the standards of care delivered across the sector. Despite this, a 2024 integrative review revealed limited research focused on organisational culture in aged care. This presentation reports on the **Results:** of a study privileging the voices of registered nurses (RNs) employed in residential and community aged care settings in rural and regional Australia, describing and analysing their reflections and understandings on optimising organisational culture and cultures of care.
Methods: Data were collected in semi-structured interviews with 14 RNs employed in board, executive, management, clinical nurse consultant and in direct resident care roles in the aged care sector in rural and regional Australia within in the last 7 years. Appreciative inquiry, which focusses on identifying strategies for positive change, informed the interview process. Data analysis utilised the

lens of Michel Foucault. Discourse Analysis enabled understanding of the meaning of social actions, practices and power relations as identified by participants, including complementing and competing ideas on the factors that enable organisations providing aged care services to function effectively. **Results:** Participants identified that RNs should be supported to work to their full gerontological scope of practice, including in advanced practice and nurse practitioner roles to improve provision of complex care to older people in rural and regional areas. A positive organisational culture is exemplified by the values of the organisation being embodied in the behaviour of staff at all organisational levels. Formal and informal networks of power exist within organisations and teams and can be used to both stifle and promote and innovation enhancing person-centred approaches. **Implications:** This study highlighted that organisational cultures in aged care should support RNs working to full scope of practice. Collaboration between nursing peak bodies, regulatory authorities and the university sector must continue to refine structures that support quality care delivery and an organisational culture reflective of staff capacity and capability. Further research is required to review, develop, and integrate contemporary nurse-led models of care across aged care settings in rural and regional Australia with a view to advancing policy and practice in the sector.

Strengthening rural communities

SR1 - Engage, Explore, Empower - Wagga Youth Forum (Open)

Dr Andreia Schineanu

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In 2024, the Wagga Local Health Advisory Committee (LHAC) - a volunteer group made up of community members and health professionals who work in partnership with the Local Health District to represent community perspectives, identify health priorities, and strengthen connections between health services and the people they serve - partnered with local schools, service providers, and community organisations to host a Youth Mental Health Forum. The event engaged over 150 year 7 students in a practical, empowering, and stigma-reducing conversation about mental health. A key feature of the forum was a scavenger hunt, a dynamic activity that encouraged students to navigate between service provider stalls, collect information, and actively learn about the range of local supports available. This approach transformed what could have been a passive information session into a collaborative, curiosity-driven learning experience. Participating organisations included mental health clinicians, youth services, peer support groups, community health teams, and local non-profits, each contributing interactive resources and activities. The LHAC played a pivotal role in coordinating stakeholders, ensuring representation from both mainstream and culturally specific services, including those providing targeted support for Aboriginal and Torres Strait Islander young people. By fostering these partnerships, the forum created a safe, inclusive environment where youth could ask questions, share experiences, and gain confidence in help-seeking behaviours. Feedback collected from students, teachers, and participating organisations was overwhelmingly positive. Students reported that the interactive design made the information more memorable and relevant, while service providers valued the opportunity to directly connect with young people outside of a clinical or crisis setting. Teachers noted that students returned to class with an improved understanding of mental health, an increased awareness of support networks, and a greater willingness to discuss wellbeing openly. The success of the forum highlights the importance of co-designed, activity-based mental

health engagement for young people. It demonstrates how local advisory committees can act as effective convenors, linking health services, educators, and youth in meaningful ways that translate into better awareness and early intervention. This model offers a scalable, community-led approach that could be adapted to other regional and rural contexts, where stigma and access barriers can be significant.

SR2 - Regulatory Intervention and Rural Injury Prevention: A Preliminary Review of the 2019 Quad Bike Safety Standard in Australia (General)

Dr Rajneesh Kaur

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Background and Aims: Quad bikes are widely used in Australian agriculture but are a leading cause of fatal farm-related injuries, particularly in older male workers. In response to the ongoing injury burden, the Consumer Goods (Quad Bikes) Safety Standard 2019 was introduced to improve vehicle stability and mandate operator protection devices (OPDs). This study aimed to assess trends in work-related quad bike fatalities from 2001–2024, particularly since the Standard's implementation, and explore the potential role of regulation and enforcement in improving rural safety outcomes.
Methods: Data were extracted from the National Coronial Information System, focusing on work-related quad bike deaths. Cases were analysed by location, mechanism (e.g. rollover), age group, and cause of death. To assess trends over time, rolling four-year fatality totals were calculated nationally and by jurisdiction. A one-sample Wilcoxon signed-rank test was used to assess statistical differences in medians over time for all work-related deaths and rollover-specific incidents.
Results: Of 334 total quad bike deaths, 161 (49%) were work-related, with 95% occurring on farms. Most decedents were male (80%) and over 50 years of age (74%), with rollovers accounting for 65% of work-related deaths. Nationally, there was a reduction in rolling four-year totals from a peak of 138 (2016–17) to 110 (2024), though this was not statistically significant (p=0.47). A similar nonsignificant trend was observed for rollover deaths (p=0.63). However, Victoria showed a statistically significant reduction in rollover-related deaths (p=0.045), which may be associated with stronger regulatory enforcement in that jurisdiction.
Implications/Conclusion: This preliminary review suggests that the introduction of the 2019 Safety Standard may be contributing to modest declines in work-related quad bike fatalities, with enforcement appearing to play a critical role. The findings highlight the value of combining engineering controls with regulatory action and economic incentives to enhance rural safety. Victoria's proactive enforcement model may offer a replicable framework for other jurisdictions. Continued monitoring is essential to determine the long-term impact of the Standard, particularly in reducing fatalities in rural farming communities. These findings have direct implications for rural health policy, workplace safety regulation, and injury prevention strategies.

SR3 - Supporting Aboriginal Health Practitioners to Vaccinate Mob (Open)

Mrs Diana Kubowicz, Miss Alice Gordon, Miss Wendy Holmes

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This rural health project aimed to provide culturally safe support and training for Aboriginal Health Practitioners (AHPs) in WNSWLHD, enabling them to confidently administer influenza vaccines to vulnerable populations. As this project was commenced to enable staff to work to the Authority and Standards which allowed Aboriginal Health Practitioners (AHPs) to expand their scope of practice to

include administering influenza vaccinations to individuals aged 5 and over. WNSWLHD is supported by a strong and committed AHP workforce who play a vital role in delivering care to Aboriginal communities across diverse settings. This initiative aims to strengthen that workforce by enabling AHPs to provide culturally appropriate immunisation services. Expanding their scope helps reduce the risk of severe influenza-related illness and hospitalisation among both Aboriginal and non-Aboriginal people in the region. A blended learning pathway, localised procedures and a mentoring system were developed to guide and support AHPs to become qualified. This project has expanded the immunisation workforce to provide culturally appropriate care and reduce the burden of influenza-related illness and hospitalisations. By July 2025, nine AHPs were qualified vaccinators. Between April & July 2025, AHPs had vaccinated 437 people living in Western NSW. The initiative's resources and pathways were shared with the Ministry of Health, supporting the training of AHPs across the state. The program successfully empowered AHPs to use their clinical skills to deliver safe, effective influenza vaccinations, reducing disease burden and strengthening culturally appropriate care in communities. For the AHPs, being able to supply and administer the influenza vaccines meant they could "help protect our mobs, through acquired immunisation in a safe and protected environment".

SR4 - The Impact of the Bathurst Men's Walk and Talk Program on Well-Being Outcomes in Rural Men - A Cross-Sectional Study (General)

**** WINNER OF BEST GENERAL RESEARCH ORAL PRESENTATION ****

Dr Uchechukwu Levi Osuagwu

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Background & Aim(s): Men in rural areas often face systemic and cultural barriers to accessing mental health services, including limited resources, geographic isolation, and social stigma. The Bathurst Men's Walk and Talk (BMW&T) program was established in 2019 to provide a free, community-led space for men to engage in informal social connection through weekly walks. Run by local volunteers and supported by community sponsorships, the program aims to foster mental and social well-being. This study evaluated how participation in BMW&T relates to various dimensions of well-being, mental, physical, psychological, social, and spiritual, and whether it encourages broader social engagement. It also assessed the program's potential to be adapted for use in other rural communities.

Methods: A web-based, cross-sectional survey was conducted between November 2023 and February 2024 among 40 men aged 40–79 who had participated in the program at least once. The WHO-5 Index was used to assess well-being, with a score below 13 indicating poor well-being. Social interaction was measured using a modified Duke Social Interaction Scale, where a score of 6 or below indicated social isolation. The frequency of BMW&T attendance was used as a proxy for program intensity. Data were analysed using polychoric and polyserial correlations and multivariate regression models adjusted for age and employment status.

Results: Most participants were older, educated, and in relationships. Weekly participation in BMW&T was reported by 63.4%, and 56.1% engaged in regular exercise. While the mean WHO-5 score was 15.94, 26% of respondents scored below the well-being threshold. Social isolation was evident in 42% of the men. A high proportion (68.4%) reported experiencing at least one major life stressor in the past year, with 23.6% reporting three or more. BMW&T participation showed strong positive associations with well-being, particularly spiritual ($r = 0.57$), mental ($r = 0.54$), and psychological ($r = 0.52$) domains. Multivariate analysis confirmed significant associations with overall well-being ($\beta = 1.59$; 95% CI: 0.53–2.64) and social connectedness. Higher participation was linked with increased

community engagement (AOR = 3.28; 95% CI: 1.45–7.42), and regular exercise was independently associated with better psychological well-being (AOR = 2.60; 95% CI: 1.12–6.02).
Implications/take-home message: BMW&T appears to be a valuable model for improving well-being and fostering social connection among rural men. Its informal, peer-led approach offers a scalable intervention that may complement existing mental health strategies in rural communities. Longitudinal studies are recommended to confirm its long-term impact.

SR5 - Walking Towards Well Being: Social Prescribing in Rural Australia (Student)

Ms Jia Rajesh Thadani, Ms Lazmi Binte Kabir, Ms Paula Cahill

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Background: Social prescribing (SP) is when healthcare professionals refer patients to community-based, non-clinical services. While common in the United Kingdom and Europe; it is seldomly used in Australia and there is a paucity of literature suggesting its effectiveness in rural settings. This study evaluates the applicability of SP in Bathurst.
Methods: This mixed-method study was conducted from June 2024 to January 2025 involved women participating in the Central West Women's Health Centre (CWWHC) Bathurst Women Walk, a free weekly, inclusive walking group with low membership. Semi-structured face-to-face interviews were conducted with the participants and the executive director using open-and close-ended questions, with guided discussion to assess program effectiveness. Interviews explored perceptions, ways of improving membership, personal factors, baseline mental and physical health, as well as their recommendations. Thematic analysis followed the Braun and Clarks framework to develop recommendations for rural general practitioners (GPs) to implement SP initiatives effectively.
Results: Nine audio-recorded interviews were deidentified, transcribed and analysed thematically. Themes were grouped into facilitators and barriers to physical and mental health. The ages of the women ranged from 65-75. Facilitators included increased physical activity, motivation, health awareness, and environmental benefits. Patients reported gaining strength and motivation to make health-related changes. Other facilitators were community interconnectedness, accessibility, inclusivity, and community awareness. Mental health was supported through enhanced mood, well-being, social connection, support, routine, and structure. Barriers to mental health included shyness, anxiety, age differences, disabilities, and personal challenges like family responsibilities. Physical health barriers included weather, age, physical limitations, lack of referrals, low awareness, lethargy and injury-related absences.
Conclusion: This study demonstrated the positive impact of SP in a rural Australian context, with participants reporting improved mental and physical health, enhanced motivation, stronger social connection, and increased health awareness through engagement in the CWWHC walking group. SP proved to be a low-cost, community-based intervention that supports holistic, preventative care. Barriers such as limited referrals and low community awareness, underscore the need for GP engagement for structured integration of SP into rural health systems. Strengthening collaborations between GPs, community organisations, and patients is essential for embedding SP into routine care and ensuring its sustainability as a tool for chronic disease prevention and improved community well-being in rural settings.
Take home message: Social prescribing can improve health and well-being in rural communities. GPs are central to its integration and strengthening GP awareness alongside community partnerships is essential for sustainable, preventative rural healthcare delivery.

Enhancing access to rural healthcare

EA1 - Multidisciplinary Care and Survival Patterns in Stage III Non-Small Cell Lung Cancer: Insights from a Regional Australian Centre (Student)

Mr Ian Burton

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Background and Aims: Lung cancer remains the leading cause of cancer-related mortality, with stage III non-small cell lung cancer (NSCLC) representing the most advanced stage amenable to curative-intent treatment. Outcomes are shaped by factors related to smoking and healthcare engagement, including socioeconomic status, remoteness, age, and comorbidities. Multidisciplinary team (MDT) involvement is associated with improved survival and reduced delays in care. Whilst delays may contribute to rural disparities, existing evidence is inconsistent and largely metropolitan-focused. The Optimal Care Pathway (OCP) defines recommended timeframes for referral, diagnosis, and treatment. This study examined five-year survival, OCP adherence, and epidemiological patterns in a regional setting, aiming to identify predictors of mortality and delays. We also sought to evaluate how the integrated care model in our regional centre influenced performance against metropolitan benchmarks.

Method: This retrospective single-centre cohort study investigated stage III NSCLC patients managed at the Riverina Cancer Care Centre (RCCC) between 2010–2025 (n=125). RCCC is the primary oncology provider for the Murrumbidgee Local Health District and operates within a regional referral network supported by outreach clinics, general practitioners (GPs), and metropolitan centres. Data on demographics, treatment, survival, and OCP intervals were manually collected from RCCC's electronic records and analysed using Kaplan-Meier estimation, Cox proportional hazards, and linear regression modelling. All patients received MDT planning.

Results: Five-year survival was 26% (95% CI: 19–36%). Mortality was significantly associated with age (HR/year: 1.05; 95% CI: 1.02–1.07); sex and treatment intent were non-significant. Rurality and smoking history did not predict mortality. OCP adherence varied: the median GP-to-Lung Cancer Specialist (LCS) interval was 4.0 days (93% adherence), whilst LCS-diagnosis (13.0 days; 59.7%) and LCS-treatment (46.0 days; 44.3%) intervals saw reduced adherence. Rurality and palliative-intent treatment were associated with longer delays.

Conclusion: Survival outcomes in this regional cohort were comparable to metropolitan benchmarks, likely due to strong MDT engagement and formalised referral pathways. High GP-LCS adherence reflects effective collaboration between rural GPs and RCCC's MDT, enabled by established regional networks. However, later-stage delays mirror national challenges, underscoring the need for enhanced diagnostic and surgical services locally, such as endobronchial ultrasound, thoracic surgery, and molecular testing. Findings support scalable models of rural cancer care and provide key baseline metrics to inform the National Lung Cancer Screening Program. This study highlights how interdisciplinary collaboration and regional networks can deliver timely, coordinated care in rural Australia, advancing both clinical outcomes and equity in lung cancer management.

EA2 - Forecasting Age-Specific Trends in Breast Cancer Incidence and Mortality in Australia, 2022–2050 (Emerging)

Dr Kasuni Akalanka

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Background and Aims: Breast cancer (BC) remains the most commonly diagnosed cancer and a leading cause of cancer-related mortality among women in Australia. While improvements in screening and treatment have enhanced survival, the overall disease burden continues to rise, particularly among older women. Understanding age-specific patterns of incidence and mortality is essential for guiding evidence-based prevention and control strategies. Therefore, this study aims to analyse current age-specific patterns of BC incidence and mortality in Australia and to forecast the burden up to 2050.
Methods: Data were obtained from the GLOBOCAN 2022 database developed by the International Agency for Research on Cancer. Incidence and mortality estimates were extracted from the Cancer Tomorrow platform, which projects cancer burden using demographic forecasts from the UN World Population Prospects. Projections for BC incidence and mortality generated up to 2050 were extracted according to age groups. The mortality-to-incidence ratio (MIR) was calculated by dividing the number of deaths by new cases within each age group.
Results: In 2022, BC accounted for an estimated 21,900 new cases and 3,400 deaths among Australian women (MIR ≈ 0.16). By 2050, incidence is projected to rise to 49,800 and deaths to 9,100 (MIR ≈ 0.18). Age-specific analysis showed a clear increase in burden. Among women aged 20–34 years, 5,200 cases and 20 deaths were reported in 2022 (MIR ≈ 0.004), projected to increase to 8,300 cases and 40 deaths by 2050. In the 35–49 group, cases will rise from 3,800 to 6,700, and deaths from 310 to 550 (MIR ≈ 0.08). For ages 50–64, cases will double from 7,500 to 15,300; deaths will rise from 790 to 1,600 (MIR ≈ 0.10–0.11). The 65–79 group shows the greatest increase: 7,300 to 16,500 cases and 1,200 to 2,700 deaths (MIR ≈ 0.16). In women aged 75-80+, incidence is projected to rise from 4,800 to 15,800, and deaths from 1,500 to 5,300, reflecting the highest age-specific lethality.
Conclusion: BC incidence and mortality in Australia are projected to rise significantly by 2050, with the burden disproportionately affecting women aged 50 years and older. The persistently high MIR in older women and the rising incidence among younger cohorts highlight critical gaps in prevention and care. These findings emphasise the need for age-specific strategies to improve screening uptake, early diagnosis, and access to timely treatment.

EA3 - Improving Rural Surgical Access: A Pilot Evaluation of Rural Generalist Surgical Services in Parkes, NSW (Emerging)

Mr Antez Varghese, Ms Brianna Mead

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Background and Aims: The limited surgical access to the 7 million Australians located remotely or rurally is well documented. There is a small population of specialised Rural Generalists (RGs) delivering surgical services to rural and remote communities, including Parkes, NSW. Little is known about the medical and social impact of these services when compared to their urban specialist surgeon counterparts. This study will focus on the implications of providing a surgical service that addresses the needs of patients who would otherwise need to travel significant distances for basic surgical care. This study will examine surgical procedures performed, patient demographics and decision-making, the impact of the local surgical service, and referring clinician perspectives. Hence,

it will highlight the importance of retaining skilled Generalists in rural settings and the potential consequences of their absence.
Methods: the project involves a mixed-methods approach, utilising quantitative data from surgical records. Additionally, quantitative and qualitative data from patient surveys and interviews with referring clinicians will be used to provide a comprehensive understanding of the value of this surgical service. Recruitment has commenced and will continue until August 2026. Surgical records have been accessed through eHealth NSW to examine demographics and surgical procedures delivered.
Results: The audit data will be presented and will demonstrate the range and frequency of surgical services provided by a Rural Generalist with surgical competencies (FACRRM (Rural Surgery) in Parkes and identify community-specific needs. Data for patient surveys and clinician interviews will be presented, and any challenges will be discussed. The evaluation will explore how local surgical services influence patient decision-making, particularly regarding preferences for nearby services versus those requiring travel. Qualitative insights from clinicians will show local referral patterns and barriers within the current system. A cost analysis will compare out-of-pocket expenses for local versus distant services.
Implications/ Conclusion: The research will address critical issues regarding the limited accessibility of surgical procedures for populations in rural and remote areas. This gap in healthcare provision can potentially be mitigated by the integration of Rural Generalists possessing surgical competencies into the healthcare workforce. The need for increased capacity in surgical skills in rural and remote areas is well recognised and documented in The Royal Australasian College of Surgeons (RACS) Collaborate for Rural; Rural Health Equity Strategy 2021. Ultimately, the findings may contribute to the ongoing discourse on rural healthcare provision and inform policy aimed at improving access to surgical care in underserved areas.

EA4 - A Hidden Population, A Hidden Problem: Exploring Drug & Alcohol Treatment Barriers for Older Adults in Rural Australia (Emerging)

Ms Meredith Eagle, Dr Catherine Keniry

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Background & Aims: Alcohol and other drug problems contribute to increased harm throughout the lifespan, yet there remains limited understanding of the experiences and needs of older adults in this area. With an ageing population and the underdiagnosis of alcohol and other drug problems within this demographic, understanding the factors that influence treatment access for older adults is critical for improving health care.
Methods: A critical realist qualitative approach was used, with data collected in focus groups to gather insights from health workers in specialised drug and alcohol services, and older adult-focused services. Participants were asked about their perceptions and experiences of working with older adults who have alcohol or other drug problems, including exploration of barriers and enablers to treatment access.
Results: Preliminary findings indicate that alcohol is the primary substance of concern among older adults, yet the problem remains largely hidden due to generational social norms and cultural factors. Many older adults do not identify their use as a problem, and health workers report feeling ill-equipped to respond due to role constraints and concerns of harming therapeutic relationships.
Implications: The complex transitions related to ageing, including wide-ranging health and social changes, necessitate a nuanced approach to treatment. The findings highlight the need for education initiatives in health services and the community, and the establishment of referral pathways and specialised services that consider the unique challenges faced by older adults. The findings underscore the importance of integrating substance use discussions into routine care for older adults. Policymakers should prioritise resource allocation for health worker education and training, developing health promotion initiatives for rural communities, and establishing clear referral pathways

to ensure older adults receive appropriate treatment and support. Addressing these problems is vital for enhancing treatment access and improving health outcomes for older adults.

EA5 - Endoscopic Retrograde Cholangiopancreatography Outcomes for Indications Other Than Choledocholithiasis in Regional NSW: A Single-centre Retrospective Audit (Student)

Mr Angus Waldon

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Background and Aims: Endoscopic retrograde cholangiopancreatography (ERCP) provides definitive treatment for several pancreaticobiliary diseases. ERCP is, however, technically challenging and associated with a high complication rate. In Australia, most ERCPs are performed in tertiary, metropolitan hospitals, though a small number of regional hospitals including Orange Health Service (OHS) also perform ERCPs. Regional ERCP decreases the patient risk and financial cost associated with aeromedical evacuation, supports regional cholecystectomy services and improves rural access to ERCP. These benefits must be balanced against concerns in the international literature that low-volume ERCP hospitals have poorer outcomes. A retrospective audit of ERCPs performed to treat choledocholithiasis at OHS has recently been completed, which demonstrates acceptable outcomes. This project aims to complete this audit by including the remaining ERCPs performed for indications other than choledocholithiasis during this period.
Methods: All non-choledocholithiasis ERCPs performed at OHS between January 2020 – January 2025 were identified with procedure codes and by cross-checking the previous audit. Data on patient demographics, ERCP indication and outcomes was extracted from the Electronic Medical Record.
Results:385 ERCPs were performed on 285 patients for indications other than choledocholithiasis at OHS over the past 5 years. The most common indications were malignant obstruction, complications of prior cholecystectomy or ERCP, and cholangitis. 81% were emergency procedures, of which 61% required emergency transfer from another hospital. CBD cannulation and stent placement were achieved in 94% and 90% of ERCPs when indicated, respectively. The rate of treatment failure, complications and all-cause mortality was 11.4%, 11.2% and 6.0%, respectively. Most deaths were due to metastatic disease. The specific complication rates were 5.7% for pancreatitis, 4.4% for cholangitis, 1.6% for haemorrhage and 1.0% for perforation. 1.8% of ERCPs resulted in a life-threatening complication. There was no significant association between patient rurality and ERCP outcome, or between patient transfer and outcomes for emergency ERCPs.
Conclusions: Indications for ERCP other than choledocholithiasis include malignant obstruction, cholangitis and post-cholecystectomy bile leaks, which are associated with both greater patient morbidity and distorted anatomy, which increases the difficulty of ERCP. Accordingly, treatment failure, complications and death were more common for non-choledocholithiasis ERCPs. Combining the cohorts gave ‘overall’ rates of treatment failure, complication and all-cause mortality that are similar literature values from other regional Australian ERCP services and are within acceptable limits. Regional ERCP is safe, effective and improves rural patients’ access to a lifesaving intervention.

Virtual and digital health

VD1 - Virtual wound care in regional residential aged care settings: an implementation study protocol (Emerging)

Dr Heather Russell

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6. A/Prof, Georgina, Luscombe, The University of Sydney, georgina.luscombe@sydney.edu.au

Background and Aims: Chronic wounds present a significant health and economic burden and substantially reduce quality of life of those affected. These wounds, which do not heal as expected, are common among people living in Residential Aged Care Homes (RACHs). While evidence-based wound care is essential for better outcomes, access is especially challenging in RACHs, particularly in regional and remote areas. Current virtual care solutions offer wound analysis but lack seamless integration with video telehealth platforms, limiting their effectiveness in remote care. This implementation study, a collaboration between technology industry, healthcare and university partners, aims to assess the benefits, costs and factors associated with successful implementation of WoundView, a novel artificial intelligence (AI) wound analysis tool integrated in a video telehealth platform, linking residents and RACH staff to external wound care providers.
Methods: An observational cluster stepped-wedge implementation study using mixed methods across six to nine Australian RACHs will be undertaken with an estimated sample of 50 to 80 residents. RACH sites will be grouped into three clusters and will commence the intervention sequentially. The RE-AIM (reach, effectiveness, adoption, implementation, maintenance) framework will be used to guide data collection and analysis. WoundView's reach will be measured by the proportion of the target population who participate. Technical effectiveness will be evaluated using accuracy and reliability data from AI wound measurements, and clinical effectiveness will be assessed using health-related quality of life measures and wound outcomes. Acceptability will be determined through semi-structured interviews and satisfaction surveys with residents, RACH staff and external wound care providers. Adoption and use of the intervention among RACH sites and individual staff will be assessed along with implementation measures including adherence, adaptations and costs. Maintenance of the intervention will be evaluated by intention for ongoing use of WoundView after study completion.
Expected outcomes: The study will gather data aligned with the National Quality Forum telehealth measurement framework including access to care, cost, experience and effectiveness, and will be reported using the Standards for Reporting Implementation Studies (StaRI).Implications: Study outcomes will inform research, commercial, and regulatory perspectives such as return on investment, acceptability and real-world uptake and demonstrate the value of virtual care research in RACHs, an under investigated setting. The implementation of WoundView is expected to transform the use of telehealth for wound management and lead to earlier intervention and better access to specialist wound care for aged care residents.

VD2 - Sharing what works: quality of life impacts and service costing of virtual care for people with intellectual disability (General)

Ms Stephanie Nelson

VD3 - How do you investigate what patients think about a service they don't know exists? Assessing community acceptability of remote patient monitoring in rural health facilities (General)

Dr Anna Thompson

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5. A/Prof Georgina Luscombe, University of Sydney School of Rural Health, georgina.luscombe@sydney.edu.au

Background & aims: Unrecognised patient deterioration contributes significantly to preventable harm in hospitals. In Western New South Wales Local Health District (WNSWLHD), rural facilities reported a disproportionate incidence of serious incidents due to delayed recognition and response. To address

this, WNSWLHD implemented 'Virtual Support', a novel remote monitoring service designed to help identify deteriorating patients and escalate care when required. The WNSWLHD and the University of Sydney's School of Rural Health partnered to evaluate the Virtual Support service. This paper describes the community acceptability component of the evaluation.
Methods: Because Virtual Support operates behind the scenes and is unknown to most patients, community focus groups were used as a proxy to gauge patient and carer perceptions. Recruitment was conducted via WNSWLHD's established consumer consultation networks and online community engagement platform – Engage Western NSW Health (https://engage.wnswlhd.health.nsw.gov.au/). Three focus groups were held (two in-person in Western NSW, one online) with a total of ten participants. Focus group transcripts were analysed thematically using the Theoretical Framework of Acceptability.
Results: Participants responded positively to the concept of Virtual Support, saying that it made them feel 'safer', 'more confident' and 'more relaxed', especially in under-resourced rural settings. Most were unaware the service was in use locally, viewing this as a missed opportunity for transparency and community trust-building in the local health service; a little-known 'good news story' about investment in rural health.
Conclusion and implications: Once informed, community members viewed Virtual Support as a valuable and acceptable addition to rural healthcare. Increased public awareness of the service could strengthen trust and engagement with local health services. The Virtual Support evaluation demonstrated a successful and mutually beneficial research collaboration between the University and the local health district; showcasing the effectiveness of leveraging WNSWLHD's established community engagement networks for research recruitment and supporting the WNSWLHD's commitment to consumer involvement.

VD4 - Evaluation of SW Connect: A virtual group supervision program for rural and remote social workers. (Student)

**** WINNER OF BEST STUDENT RESEARCH ABSTRACT ****

Mr Leigh Davison

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Background & Aims: Social workers in rural, and remote areas often experience professional isolation and limited access to professional exchanges. These challenges can impact service delivery, practitioner wellbeing, professional identity, and workforce retention. Despite this, there is limited research on effective supervision programs for rural practice. This study evaluated SW Connect, a virtual group supervision program developed by and for the Marathon Health Social Work Community of Practice. Sessions are held monthly, and each session features a social work practice focus. This study explored how the program supports social work practice in rural health contexts and examined the model's delivery of supervision functions, reinforcement of professional identity, and provision of cost-effective workplace learning and professional development.
Methods: A mixed methods design was used. Quantitative data were collected via surveys using Likert and modified Likert-scale items to capture participants' perceptions. Qualitative data were obtained through open-ended survey questions and virtual focus groups. Braun and Clarke's six-phase thematic analysis guided qualitative analysis. Participants were all qualified social workers employed by Marathon Health, and SW Connect attendees. There were 8 survey participants and 3 focus group participants. Data sets were analysed independently and subsequently synthesised.
Results: SW Connect was reported to provide a collaborative environment with strong supportive and educational supervision functions. Participants described increased connection to the Marathon Health Social Work Community of Practice, reinforcing both individual and collective professional identities. Reported benefits included enhanced reflective practice, strengthened alignment with core professional values, exposure to diverse perspectives, and professional growth. An improvement point was identified with participants expressing interest in more clinical content, including case discussions to support direct practice learning.

Challenges: Recruitment and data collection were challenging. Participant availability was limited due to overlapping schedules with a brief data collection period for master's project feasibility. A potential conflict of interest existed, as the researcher was involved in the founding and delivery of SW Connect. To mitigate this, a research administrator managed recruitment and an external facilitator conducted focus groups. While these steps reduced bias, they may have influenced participation.
Implications: The SW Connect program demonstrates an approach to group supervision that provides workplace learning and professional development in rural and remote settings. This study contributes to the limited research on social work group supervision and suggests that similar programs to SW Connect could be implemented elsewhere to provide workplace learning opportunities, foster connection, enhance professional identity, and support sustainable workforce development.

VD5 - Partnering to build an oral and dental health network in regional NSW. (General)

A/Prof Melissa Nott

1. A/Prof Melissa Nott, Three Rivers University Department of Rural Health, mnott@csu.edu.au

Background: Good oral health is fundamental to overall health and wellbeing, yet access to oral health services for priority populations such as older adults, First Nations peoples, and people living in rural and remote communities can be limited. There is high workforce demand in rural areas for oral and dental health professionals. The existing network of University Departments of Rural health can be leveraged to develop service-learning placements to increase rural training and service opportunities for oral health and dental students.1 Aim: This presentation will share patient and student outcomes from a partnership established in 2022 between Charles Sturt University's Centre for Rural Dentistry and Oral Health, the School of Dentistry and Medical Sciences, and Three Rivers Department of Rural Health, to develop, implement, and evaluate a portable dentistry and oral health program.
Methods: A program logic was developed to inform the Service Delivery Model which was implemented in 2022-2024. Five residential aged care facilities in Western NSW and Murrumbidgee regions entered into service-learning agreements and hosted dental students, under the supervision of qualified Dentists. Patient service delivery data and student attendance data were prospectively collected and entered into a centralised database for descriptive analysis.
Results: 228 appointments were offered to residents during the 3-year pilot program. 67 residents (n=29%) attended more than one appointment. 112 fourth year dental students participated in the pilot program, totalling 879 hours of clinical placement. One-third of residents had last received dental care 4 or more years prior, highlighting a critical health access issue. 184 residents (85%) received an oral and extraoral examination and 162 of these (97%) also received an oral cancer screening. The most commonly documented oral diagnoses were caries, plaque, gingivitis, and denture stomatitis. Following Service Delivery Model expansion in 2024, 49 low-risk interventions were delivered including oral health education, denture cleaning, fluoride application and denture relining. Nil adverse events were reported.
Take-home-message: A portable dentistry service delivery model, involving dental students and regionally based dentist supervisors, was found to be an effective, acceptable, and safe way to provide much needed oral and dental healthcare to older adults living in residential aged care in rural and regional NSW. This service delivery model may be also suitable to priority populations in other residential care settings such as long-term mental healthcare and residential disability services. KBC Australia, 2022. Increasing Dental and Oral health training in rural and remote Australia. Available: https://www.health.gov.au/resources/publications/increasing-dental-and-oral-health-training-in-rural-and-remote-australia-feasibility-study-final-report?language=en

CONCURRENT SESSION 2 - AFTERNOON

Emergency and mobile medicine

EM1 - A retrospective descriptive study of patients transported by fixed wing aircraft requiring an emergency doctor from the Broken Hill Royal Flying Doctor Service base. (Student)

Ms Grace Ross

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Background & Aims: The Broken Hill Royal Flying Doctor Service (RFDS) provides emergency medical care to patients in Western New South Wales (NSW). The aim of this study was to describe the types of aeromedical retrievals requiring the attendance of a medical officer from the Broken Hill RFDS base.
Methods: A retrospective cross-sectional study design was used to describe retrievals from the Broken Hill RFDS base from the 1st of July 2022 to the 30th of June 2023. Data was extracted electronically and manually from the Flight Patient Medical Information (PMI) database and paper records. Data collected included patient demographics, flight details, provisional diagnoses and interventions. An initial 975 records were reviewed, and 175 met the inclusion criteria. Diagnosis was categorised using the International Statistical Classification of Diseases (ICD10AM).
Results: Of the 175 retrievals, the mean patient age was 52.2 years (±22.3), with a male-to-female ratio of 1.4:1. Most patients were stable prior to RFDS arrival (79%) and were being transferred between hospitals (86%) from very remote (MMM 7) areas (91%). The leading provisional diagnoses were trauma/injury (25%), cardiac (22%), and infectious conditions (10%). Common interventions included access lines, investigations, and intubation, while the most frequently administered medications were analgesia, fluids and sedation. The median time from request to scene was 105 minutes; from scene to destination, 158 minutes; and total time in RFDS care averaged 275 minutes.
Conclusion: This study demonstrates the diversity of care and interventions provided by medical officers from the Broken Hill RFDS base, and the complexity and severity of patients in predominantly remote locations. These findings will inform RFDS service planning, workforce training, and rural health policies to better meet the needs of remote populations.

EM2 - Differences in Door-to-Device Times between self-presenting and ambulance delivered ST-Elevation Myocardial Infarction patients in Western New South Wales: A Retrospective Cohort Study (Student)

Mr Daipayan Mukhopadhyay

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3. Mrs Estelle Ryan, Western New South Wales Local Health District - Orange Health Service, Estelle.Ryan@health.nsw.gov.au
4. A/Prof Georgina Luscombe, University of Sydney, Georgina.Luscombe@sydney.edu.au

Background and Aims: Rapid reperfusion – restoring blood flow to heart muscle - is critical in heart attacks known as ST-Elevation Myocardial Infarction (STEMI). Rural patients face delays in receiving the gold standard life-saving treatment that opens coronary arteries, Percutaneous Coronary Intervention (PCI). While ambulance transport is known to reduce time to treatment, little is understood about how patient demographics, clinical history and system-level factors may influence treatment delays particularly for STEMI patients who self-present to hospital in rural settings. Beyond

transport mode, the roles of patient factors and hospital operations—especially out-of-hours arrival—are less clear in rural settings. This study investigates whether mode of presentation (self-presentation vs ambulance) impacts Door-to-Device (DTD) time (time from hospital arrival to PCI treatment) in a rural, PCI-capable hospital – Orange Health Service (OHS). It also explores whether clinical and demographic variables including age, sex, comorbidities, prior PCI, rurality (Modified Monash Model), and out-of-hours presentation are associated with treatment delays.
Methods: A retrospective cohort analysis was conducted using clinical data from the National Cardiac Outcomes Registry collected at OHS for PCIs between January 2022 and December 2024. Multivariable logistic regression models were used to assess the odds of prolonged DTD time (≥90 minutes) based on presentation mode and patient-level characteristics.
Results: Out of 244 procedures, 24% of cases had DTD ≥ 90 minutes. Out-of-hours arrivals were more frequent among delayed cases (66% vs 45%, p = 0.008). In the fully adjusted model, out-of-hours remained the only independent predictor (adjusted Odds Ratio 2.37, 95% CI 1.25–4.49). Mode of arrival, prior PCI, diabetes, age in years, and rurality were not significant predictors of DTD delay.
Implications: In this rural PCI service, time of arrival appeared to drive in-hospital delays. The off-hours presentation likely reflects slower team mobilisation and cardiac catheter-lab activation, compounding long prehospital pathways typical of rural care. The low variance accounted for in the regression model based on self-presentation, age, diabetes, prior PCI, or rurality suggests that unmeasured operational factors may explain delays once STEMI is recognised. Limitations include retrospective design, reliance on complete cases, and absence of granular process timestamps (e.g., ED-to-ECG, activation-to-lab), which likely explain additional variance. In this rural PCI-capable setting, after-hours presentation was the main predictor of prolonged DTD. Optimising after-hours pathways (direct cath-lab activation, defined on-call response standards, streamlined ED-to-lab transfers) and community messaging to encourage Emergency Medical Service activation are likely to yield greatest gains in reperfusion timeliness for rural STEMI patients.

EM3 -Enhancing Access to CT Services in Rural and Remote Areas of New South Wales – Mobile CT (Student)

Nicholas Ruthenberg

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8. Mervyn Holmes-Wighton, Aboriginal Health & Wellbeing, Western NSW Local Health District, Mervyn.Holmeswighton@health.nsw.gov.au

Abstract: Access to diagnostic imaging in rural and remote communities remains a significant challenge. This project evaluates the effectiveness of a mobile CT service deployed in Walgett, Western NSW, aiming to improve access, reduce travel burdens, and enhance health outcomes. The study seeks to understand utilisation patterns, stakeholder experiences, and the economic impact of the service to inform future healthcare strategies in similar settings.
Methods: A mixed-methods approach will be used across five phases: Retrospective audit of CT scans performed in Walgett (June 2023–July 2024), analysing patient demographics, scan reasons, and outcomes. Health outcomes evaluation focusing on timeliness of diagnosis, treatment initiation, and patient satisfaction. Patient experience survey and interviews using purposive sampling to explore comfort, anxiety, and decision-making around accessing local services. Healthcare provider survey to assess operational efficiency, integration, and training needs. Economic analysis evaluating cost savings in transport and accommodation, and increased service reach. Data will be sourced from NSW Health systems (Karisma, Sectra, EMR), with surveys hosted in REDCap and interviews transcribed verbatim. Analysis will be conducted using Excel, Stata, or SPSS.
Results or Expected Outcomes: The study is expected to demonstrate improved access to CT services, reduced travel distances and wait times, and enhanced patient and provider satisfaction. It

will identify key facilitators and barriers to service adoption and integration. Economic analysis will highlight potential cost savings and increased diagnostic coverage in the region.
Implications or Take-home Message: Findings will inform the scalability of mobile CT services in other rural and remote areas, supporting equitable access to diagnostic imaging. Insights into stakeholder experiences and economic viability will support future planning and resource allocation for regional and rural health services across Australia.

EM4 - How to support clinical pathway use in emergency departments to treat cardiac symptoms: A project prioritising rural clinician perspectives. (Emerging)

**** WINNER OF BEST EMERGING RESEARCH ABSTRACT ****

Ms Cindy Earl

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2. Ms Stacey Casley, Murrumbidgee Local Health District, Stacey.Casley@health.nsw.gov.au

Background and Aims: Emergency department (ED) clinicians must provide timely critical interventions for patients presenting with heart attack symptoms (that is, suspected Acute Coronary Syndrome (ACS)). This need is heightened in rural contexts where patients can travel greater distances to ED and may require transferring for further treatment. In NSW, immediate management of suspected ACS should be guided by a clinical pathway, however, research has demonstrated clinical pathway adherence is low. This project aims to understand why an ACS Pathway is or is not used when a patient presents to ED. We aim to identify what changes should be implemented in EDs of different capacities and remoteness to support clinical decision-making now and as Australia's health systems become fully digitalised. In this presentation, we will discuss the process and progress of designing and conducting this rural clinician-initiated, co-designed and co-led research project: a collaboration between Charles Sturt University, Murrumbidgee Local Health District and NSW Health's Agency for Clinical Innovation.
Methods: Commencing earlier this year, the project includes a systematic review of the literature, longitudinal analysis of a rural LHD's patient data to examine trends in ACS Pathway use between 2021-2025, a survey of NSW ED clinicians to understand barriers and enablers of pathway use, and interviews with NSW ED clinicians to contextualise these findings. Expert groups will support the development of recommendations from the project.
Expected outcomes: The project arose out of a small-scale study which identified that while an ACS clinical pathway is only documented in approximately one-third of presentations with a subsequent heart attack (acute myocardial infarction) diagnosis, it is associated with better time-to-intervention for troponin collection, aspirin administration and transfer to a site capable of performing coronary angiograms. The research is designed to produce recommendations for NSW Health to enhance adherence to ACS clinical guidelines through a decision-support tool, such as a revised ACS pathway.
Take home messages: We discuss project challenges and successes so far. Overall, this project demonstrates the importance of local connections between health services and universities to conduct research prioritising rural health service experiences. Attracting NHMRC funding has helped expedite the research, ensuring relevance to our partners and the rapidly changing health technology and service delivery landscape. It also means dedicated research upskilling for our team's rural clinician-researchers, and lower research administrative burden which supports us to maintain our clinical workloads.

EM5 - Are Rural Australian STEMI patients disproportionately affected by LVEF Dysfunction? (Student)

**** WINNER OF BEST STUDENT RESEARCH PRESENTATION ****

Mr Jacob Stretton

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3. Mrs Estelle Ryan, Western LHD, estlelle.ryan@health.nsw.gov.au

4. Dr Ruth Arnold, Western LHD, ruth@coldhearts.com.au

Background: ST-elevation myocardial infarction (STEMI) reflects coronary occlusion requiring urgent reperfusion. Rural Australians experience higher STEMI rates but are frequently treated with thrombolysis rather than primary percutaneous coronary intervention (PCI)—the gold-standard. Primary PCI involves immediate catheter-based reperfusion without prior thrombolysis. In Western NSW, a 'drip-and-ship' model delivers thrombolysis at the presenting facility before transfer to Orange Health Service (OHS) for non-primary PCI. While in-hospital mortality appears comparable to metropolitan centres, the impact of rurality on post-STEMI cardiac outcome indicators such as left ventricular ejection fraction (LVEF) remains unclear. Aims: To assess whether Modified Monash Model (MM)–defined rurality predicts reduced LVEF post-STEMI and to examine its association with PCI type (primary/non-primary) among patients treated at OHS from January 2022 to December 2024.
Methods: We retrospectively analysed 347 STEMI cases from the National Cardiac Outcomes Registry. Residential postcodes were mapped to MM categories. LVEF, measured by transthoracic echocardiography during index admission or within 30 days, was dichotomised into reduced (<45%) or preserved (≥45%). Binary logistic regression evaluated rurality's association with reduced LVEF, adjusting for possible confounders. Multinomial logistic regression assessed odds of non-primary PCI across MM levels.
Results: Reduced LVEF increased with remoteness, from 38% in large rural towns (MM3) to 61% in remote/very remote communities (MM6-7). The odds of reduced LVEF, compared to those residing in MM3, were significantly increased for MM4/5 (aOR 1.70, 95% Confidence Interval 1.02–2.85]) and MM6-7 (3.29, 1.41–7.70). Only 9% of MM6/7 patients received the gold-standard treatment of Primary PCI compared with 50% of those in MM3.
Conclusions: Rurality independently predicted both early reduced LVEF (<45%) and Non-primary PCI after STEMI. Patients in remote areas (MM6–7) had substantially higher odds of Reduced LVEF and were far less likely to receive Primary PCI. Rescue and Delayed PCI pathways were themselves associated with worse LVEF. Thus, while rural STEMI management systems may achieve in-hospital survival parity, they appear insufficient to preserve myocardial function. Early post-STEMI LVEF impairment foreshadows heart-failure burden, rehospitalisation, and reduced quality of life. Reducing this preventable morbidity will require compressing ischaemic time and maximising myocardial salvage through expanded and faster access to Primary PCI and dedicated pathways for patient's ineligible for thrombolysis. Multi-centre, prospective studies with metropolitan comparators and standardised imaging are needed to confirm these associations and quantify the clinical and economic gains of reperfusion equity.

Mental health and wellbeing

MH1 - Unveiling the Journey: Investigating the Biological and Psychological Effects of Trauma in Yazidi Women Living in Regional Australia (Emerging)

Andreia Schineanu

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Background & Aim(s): Refugee women are at elevated risk of developing trauma-related mental health conditions due to exposure to violence, displacement, and loss (Paudyal et al., 2023). Increasing evidence suggests a biological link between trauma and chronic inflammation, which may contribute to higher rates of physical illness including chronic conditions in refugee populations (Sumner et al, 2020). However, limited research has examined this relationship in resettled communities, particularly among minority ethnic groups such as the Yazidi. This study aims to explore the association between trauma-related psychopathology and chronic inflammation in Yazidi women

who have resettled in Wagga Wagga, New South Wales. A secondary aim is to understand these women's experiences of accessing healthcare in a regional Australian setting.
Methods: A longitudinal mixed-methods design is employed. Participants include 30 Yazidi women aged 18 years and older who have resettled in Wagga Wagga within the last five years. Quantitative data is collected through blood samples measuring selected inflammatory markers, alongside validated psychological assessments for trauma-related symptoms, including PTSD, depression, and anxiety. Qualitative data will be gathered through semi-structured interviews to explore participants' resettlement experiences, healthcare access, and perceptions of wellbeing. Data collection will occur at baseline, 6, 12 and at 18-month to assess changes over time. Comparable data and biological samples are collected from a control group made up of 30 women of non-refuge background to control for variability in natural inflammatory processes.
Results or Expected Outcomes: The study is expected to establish baseline data on the relationship between trauma-related psychopathology and chronic inflammation in Yazidi refugee women. Preliminary blood test results will be presented, along with the results of psychological measures. Study findings will provide insight into how prolonged psychological stress and trauma may contribute to inflammation-related chronic disease risk. The qualitative findings are anticipated to highlight both facilitators and barriers to healthcare access in regional Australia, including cultural, linguistic, and systemic factors.
Implications or Take-Home Message: This research will contribute to the limited evidence base on trauma, inflammation, and health service access among resettled refugee women. It will offer culturally grounded insights to guide the development of trauma-informed, community-based interventions aimed at reducing long-term health risks in refugee populations. Findings will also inform healthcare providers and policymakers about the need for accessible, inclusive services that support both mental and physical wellbeing for refugee communities in regional and rural settings.

MH2 - Effectiveness of Behavioural and Psychosocial Interventions for Improving Adolescent Mental Health in Rural Areas in Higher Income Countries: A Systematic Review of Randomised Controlled Trials (Student)

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Background & Aim The evidence base for adolescent mental health interventions in rural areas of high-income countries (HICs) is still emerging. Although it is likely that tailored approaches to addressing mental health challenges in rural areas needed, no systematic synthesis of behavioural and psychosocial interventions has been conducted for this special population. This study aimed to provide a comprehensive systematic review of behavioural and psychosocial interventions for adolescents in rural areas in HICs.
Methods We systematically searched five databases for randomised controlled trials published in peer-reviewed journals between 1 January 2000 and 15 January 2025. We selected studies that evaluated behavioural and psychosocial interventions targeting adolescents aged 10-24 years living in rural areas of HICs. Data extraction included publication details, study location and design, participant characteristics, outcome measures, key findings, and limitations. We used the Cochrane risk of bias tool 2.0 (RoB 2.0) to assess the risk of bias across the included studies. Because of the heterogeneity discovered in the intervention types and outcome measures, a meta-analysis was not

feasible. Instead, we conducted a narrative synthesis, categorising results by intervention types. This review is registered with PROSPERO (CRD42025642163).
Results Our search identified 7,384 non-duplicate references, of which 375 were assessed for eligibility, leading to the inclusion of 10 studies in the narrative synthesis. Most studies (n=6) were conducted in the USA, with the others being conducted in Australia, Canada, Sweden, and the UK (n=1 each). School-based interventions were the most frequently examined (n=5), followed by digital (n=2), community-based (n=2), and family-based interventions (n=1). School-based interventions showed variable effectiveness, particularly in improving mental health outcomes. One digital programme demonstrated no effect, while the other yielded modest reductions in depressive symptoms. Community-based interventions showed some promise but were constrained by evaluation limitations. The single family-based intervention produced indirect behavioural benefits via improved family dynamics, though its impact on depression was limited. Only one intervention was tailored to the study participants. All included studies were assessed as having a high risk of bias, with outcome measurement identified as the most common source of bias.
Implications Few RCTs have evaluated behavioural and psychosocial interventions tailored to rural settings in HICs. Despite these interventions show benefits for adolescent mental health, limited methodological rigour restricts understanding of their effectiveness and sustainability. Future research should employ robust designs, standardised models, broader geographic coverage, and adapt interventions to local contexts.

MH3 - Adolescent Mental Health Help-Seeking Behaviours in Rural Australia: Cross-Sectional Analysis of a Nationwide Cohort Study (Student)

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Background and aim(s): Adolescent mental health outcomes are often poorer in rural areas of Australia, and most adolescents do not seek help, highlighting a critical gap in understanding help-seeking behaviours. We examined help-seeking patterns and associated factors among rural Australian adolescents.
Methods: We analysed data from Wave 8 of the Longitudinal Study of Australian Children, including 4,837 adolescents aged 14–19 years. We estimated the prevalence of help-seeking overall and by remoteness, as defined by the Australian Bureau of Statistics. A cluster-adjusted multiple logistic regression model was used to examine factors associated with help-seeking behaviours.
Findings: Help-seeking behaviours were generally lower among adolescents from rural areas compared to their urban counterparts. Seeking face-to-face mental health professional help was significantly less common in outer regional and remote areas (7·72%, 95% CI: 5·39–10·93) compared

to urban areas (12·20%, 10·97–13·54). Furthermore, males reported significantly lower professional help-seeking behaviours (2·76%, 1·33–5·63) than females (13·53%, 9·08–19·70) in outer regional and remote areas. Similar gender disparities were observed in non-face-to-face (e.g., internet, phone) help-seeking. The most common predictors of help-seeking behaviours were ongoing anxiety or depression and good parent-child relationships. Other statistically significant predictors included suicidal thoughts and behaviours, single parenthood family, community participation, social media exposure and drug use. We also identified two predictors (i.e., financial hardship for formal help-seeking and community engagement for informal help-seeking) that varied statistically significantly between rural and urban settings.
Interpretation: Rural male adolescents had a lower prevalence of mental health help-seeking behaviours. Efforts to increase accessibility, reduce stigma, and foster equitable mental health support systems that address rural-specific barriers are essential in Australia. Adolescent-focused digital interventions and strengthening family and community engagement are vital to ensure equitable access to mental health services for adolescents in rural Australia.

MH4 - Parental Childhood Physical and Sexual Abuse and Associations with Adolescent Mental Health Outcomes: Findings from the Longitudinal Study of Australian Children (General)

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Background & Aims Evidence on the effects of parental experiences of childhood physical and sexual abuse on their children's mental health outcomes remains limited. This study investigates the associations between parental childhood sexual and physical abuse and childhood anxiety, depression, and psychological distress.
Methods This retrospective cohort study used data from the 2004 Growing Up in Australia cohort. Parental childhood sexual and physical abuse were retrospectively reported by primary caregivers, while children's self-reported depression, anxiety, and psychological distress were measured at Wave 8, when the children were aged 18–19 years. Multilevel logistic regression models investigated associations between parental childhood abuse and their children's mental health outcomes at ages 18–19 years.
Results A total of 3,007 children were included in the analyses. Overall, 28% of parents reported experiencing physical or sexual abuse during their own childhood. Among parents exposed to physical or sexual abuse (or both), 34% of their children had depression, 35% had anxiety, and 35% had high psychological distress. Compared with children of parents not abused in childhood, parental history of physical abuse was associated with higher odds of depression (AOR: 1.78; 95% CI: 1.08–2.94) and high psychological distress (AOR: 2.74; 95% CI: 1.38–5.41). Parental history of sexual abuse was associated with higher odds of depression (AOR: 1.67; 95% CI: 1.11–2.52), anxiety (AOR: 1.97; 95% CI: 1.08–3.61), and high psychological distress (AOR: 2.45; 95% CI: 1.34–4.46). No statistically significant associations were observed for parents exposed to both physical and sexual abuse.
Challenges: A key limitation was the small number of parents exposed to both physical and sexual abuse whose children experienced mental health outcomes. This limited statistical power may have obscured potential associations in this subgroup.
Implications Trauma- and violence-informed approaches should also account for parents' histories of childhood trauma, recognising their potential influence on children's mental health outcomes. In rural Australia, this could be achieved by embedding parental trauma history screening into existing primary health, school, and community services, supported by telehealth-based trauma-informed counselling. Training local health and education workers in trauma- and violence-informed practices, along with culturally safe engagement for vulnerable populations, would strengthen early identification and support despite workforce and service access limitations.

MH5 - Wellbeing Challenges and Support Needs of informal Carers of Autistic people in Rural, Regional and Remote Australia and New Zealand: A Scoping Review (General)

Dr Giti Haddadan

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Background: Informal carers play a vital role in supporting autistic people. Research shows that informal carers of autistic people in rural and remote communities experience unique challenges including geographical isolation, limited access to services, social and financial strain that impact caregivers' wellbeing. These challenges are often overlooked in current support strategies. The aim of this review is to explore existing literature into the wellbeing, challenges and support available for carers of autistic people in regional, rural and remote Australia and identify any knowledge gaps that can inform future support strategies.
Design: The JBI methodology for scoping reviews was used to explore the existing literature relating to Australian and New Zealand rural and remote autistic carers. Six databases (PubMed, ERIC, Cochrane, Scopus, Psycnet, CINAHL) were searched, with the last search conducted in August 2025.
Results: Twenty-three studies investigated the multifaceted challenges faced by carers of autistic children in regional, rural and remote Australia and New Zealand. The study identified that carers were predominately 30-40-year-old mothers of school aged boys, whose primary goal is to advocate for those in their care and source a diagnosis. Rural carers experienced difficulties in navigating interventions and accessing specialised services, this was exacerbated by geographical isolation.
Conclusion: Wellbeing and support structures need to prioritise interventions that are culturally sensitive and adaptable, as well as NDIS funding that considers the unique rural and remote challenges experienced by caregivers including cost burden. This is critical in addressing wellbeing and support for carers in rural and remote communities.

Partnerships and capacity

PC1 - Real-World Implementation of Nursing Professional Practice and Leadership Frameworks: A Scoping Review Highlighting Rural Healthcare Knowledge Gaps (Emerging)

**** WINNER OF BEST EMERGING RESEARCH ORAL PRESENTATION ****

Mr Luke Marks

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Background and Aims: Effective nursing leadership is crucial for healthcare quality, particularly in rural and remote settings where nurse managers face unique challenges including professional isolation, limited resources, and broader scope responsibilities. This scoping review aimed to synthesize qualitative research on nurse leaders' experiences implementing professional practice and leadership frameworks, with particular attention to geographical representation and the complex pressures facing modern nurse leaders.
Methods: A qualitative scoping review following PRISMA-ScR guidelines was conducted. Systematic searches of CINAHL, PubMed, Scopus, and other major databases identified studies from January 2015 to November 2024. Fourteen qualitative studies examining nursing leadership experiences were analysed thematically. Study settings were specifically examined to assess geographical diversity and representation of rural contexts.
Results: Five major themes emerged: Leadership Skills, Leadership Development, Leadership Challenges, Evidence-Based Practice gaps, and Workplace Culture influences. A novel 'Clinical-Administrative-Research Nexus' framework was identified, revealing how nurse leaders navigate

competing demands across clinical excellence, administrative efficiency, and research/evidence implementation. Critically, 12 of 14 studies (86%) were conducted exclusively in urban or metropolitan settings. No studies specifically focused on rural or remote nursing leadership contexts, despite rural nurse managers likely experiencing intensified nexus pressures due to broader role expectations and limited support structures.
Challenges: The urban bias in nursing leadership research presents significant challenges for understanding how the Clinical-Administrative-Research Nexus manifests in rural contexts. Rural nurse managers may face amplified nexus tensions—managing clinical duties across wider scopes, administrative responsibilities with fewer resources, and research implementation without nearby academic partnerships. This gap limits our understanding of how leadership frameworks can support rural nurses navigating these complex, intersecting demands.
Implications: The Clinical-Administrative-Research Nexus framework offers a powerful lens for understanding nursing leadership complexity, but its application requires geographical inclusivity. Collaborative rural research networks are urgently needed to: (1) investigate how the nexus manifests differently in rural versus urban settings, (2) develop context-specific strategies for managing competing demands, (3) create rural-urban partnerships that share leadership development resources, and (4) ensure the nexus framework captures the full spectrum of nursing leadership experiences. Only through inclusive, collaborative research can we develop leadership support systems that work for all nurse managers.

PC2 - Building Regional Capability: A Success Story of Medical Physics Training, Retention, and Service Innovation in Western NSW Health (General)

Dr Dilli Banjade

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Purpose: A persistent shortage of qualified Radiation Oncology Medical Physicists (ROMPs) presents a major barrier to delivering advanced radiotherapy in regional Australia. Local training and retention are critical to overcoming this challenge. While the Australian College of Physical Scientists and Engineers in Medicine (ACPSEM) Training, Education, and Assessment Program (TEAP) has addressed some gaps, remote centres continue to face recruitment and workforce sustainability issues. The Central West Cancer Care Centre (CWCCC) and Western Cancer Care Dubbo (WCCD) serve the Far and Central West NSW region, covering 247,000 square kilometres and over 300,000 people. Recruitment and retention of ROMPs have been challenging since the establishment in 2011. However, a dedicated ROMP team successfully implemented the ACPSEM ROMP-TEAP to address these challenges and to build workforce capacity.
Methods: The Medical Physics team adopted the ACPSEM Clinical Training Guide to structure registrar development and proactively secured the funding and registrar positions through advocacy and stakeholder collaboration. Gaps in specialised training, such as brachytherapy were addressed through partnerships with metropolitan centres. Departmental expansion, including the addition of TrueBeam and Halcyon linacs and HyperArc treatment enabled the delivery of advanced techniques like SABR and SRT, creating a strong training platform for registrars.
Results: Since 2015, the CWCCC has achieved full ACPSEM TEAP accreditation. A ROMP registrar was recruited in 2015, followed by a second and third registrar in 2018 and 2021. All three registrars were certified and retained as permanent ROMPs which addressed the specialized manpower recruitment issue faced by the district. Currently, three registrars are enrolled at different stages of training, supported by a stable funding and grants. To date, the team has secured three ACPSEM TEAP grants totalling $720,000.00, which is also a significant contribution for the regional economy. Registrars have transitioned from trainees to key clinical contributors, aligning with ACPSEM guidelines. Professional development is supported through workshops, conferences, and external collaborations. Visits to metropolitan centres address the gaps in techniques like brachytherapy and radiosurgery. Retention is supported through a positive work culture, competitive benefits, and career progression pathways.
Conclusion: The experience of CWCCC and WCCD demonstrates how proactive and strategic leadership, combined with a locally embedded registrar training program, can address workforce

shortages, sustain high-quality radiotherapy services, strengthen regional capacity, and serve as a replicable model for other regional cancer centres.

PC3 - Strategic Partnerships for Rural Nursing Research: Building Capacity and Capability Through Collaboration (Open)

Dr Sharon Laver, Ms Catherine Leahy

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In rural and regional Australia, nurses and midwives face persistent barriers to engaging in research, limited access to professional development, mentorship, and infrastructure restricts their ability to contribute to evidence-based care and health system reform. Addressing these challenges requires more than isolated interventions; it demands strategic, collaborative partnerships that build sustainable research networks and empower clinicians. This submission showcases the evolving partnership between Charles Sturt University's School of Nursing, Paramedicine and Healthcare Sciences and Western NSW Local Health District. Together, we are co-creating opportunities for nurses and midwives to engage in research that is locally relevant, professionally empowering, and policy-informing. The partnership is mutually beneficial. Academic staff contribute research expertise, while clinical partners bring deep contextual knowledge and frontline insights. A mentoring model has been established, pairing experienced researchers with neophyte advanced practice nurses and midwives to build capability in literature review, ethics, data collection and analysis and scholarly dissemination. A collaboratively conducted literature review, now under peer review, exemplifies this model. Ethics approval has been submitted for a joint research project, and the partnership was recently presented at the National Nursing Forum in Canberra. Importantly, the collaboration has supported individual career development. This year a Clinical Nurse Consultant was admitted into the HETI research capacity building program (the first nurse from a rural area in a number of years) and continues to receive mentorship from the team. The Nursing & Midwifery Research Excellence Centre (NaMREC) is now underway, providing a platform for ongoing research leadership and innovation. This partnership reflects the WHRN2025 theme, "Building Research Networks: Collaborative Approaches to Rural Health Research" by demonstrating how strategic collaboration can build inclusive, sustainable, and responsive research networks. It also highlights the importance of co-designed models that value both academic and clinical expertise, and the role of mentorship in fostering a new generation of rural nurse and midwife researchers. Implications for policy include the need to invest in partnership-driven research infrastructure, support nurse- and midwife-led models of care, and embed mentoring frameworks that enable rural clinicians to contribute meaningfully to the evidence base. This work is not only building research capacity, it is reshaping the future of rural health care delivery.

PC4 - Enhancing Rural Healthcare Access through University and Community Partnerships (General)

Dr Shannon Pike

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Background: Rural Australians face persistent challenges in accessing timely, local healthcare, often leading to poorer health outcomes. Travelling long distances or waiting lengthy periods is often necessary to access healthcare. In response, the University of New South Wales Wagga Wagga Campus partnered with local general practitioners to identify service gaps and patient needs, to co-design and deliver an innovative model of healthcare: visiting multidisciplinary student clinics. University students and academics within medicine, physiotherapy and exercise physiology, pharmacy and dietetics travelled to the rural communities to deliver the clinics. Aims This study aimed to investigate the experiences and perceived health outcomes of multidisciplinary student clinics from the perspectives of patients and general practitioners.
Methods: A mixed methods design evaluated clinic experiences and outcomes from the perspectives of patients and local general practitioners. Patients and general practitioners were invited to complete anonymous online surveys and patients were invited to participate in semi-structured interviews. Quantitative data were analysed descriptively. Interviews were audio-recorded, transcribed verbatim and thematically analysed to capture patient experiences and healthcare access in their communities.
Results: All participating general practitioners (n=3) reported efficient referral processes and achievement of expected patient outcomes. All but one of the patients (n=21) reported an improved understanding of the role of medical and allied health professionals in managing their health and all reported that they can now manage their health problems differently. Qualitative analysis identified three key overarching themes. Firstly, normalised limited healthcare access - participants described their acceptance of delays and travelling distances as part of accessing care. Secondly, empowered, validated and connected - participants experienced educational benefits, validation of current behaviours and prompts for future behaviour change, they were connected with ongoing healthcare via referrals and with other community members. Finally, supporting student learning – participants were happy to and found they could engage with the students.
Implications: University-community Partnerships between universities and local healthcare providers can deliver meaningful, wide-ranging benefits to rural patients. The positive outcomes from these pilot clinics are informing targeted service refinements and underpin planning for broader implementation of the multidisciplinary student clinics at scale.

PC5 - Walking Side by Side: Mentoring and support to build the next generation of Aboriginal leaders. (Open)

Ms Lynette Bullen

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In this presentation, we want to take you on a journey, a story about growing the capacity of First Nations Australians who set out not just to build their knowledge and skills in research, but to make a real difference for their communities, for their people. Our story begins with a simple but powerful question: What would it take to truly support First Nations people through the challenges of a higher degree in research, so they don't just finish, but thrive? This can be especially challenging for those living in rural towns or remote communities, where distance, limited resources, isolation and family commitments can add extra burden to the student. Over the years, many initiatives have aimed to increase the number of First Nations researchers completing PhDs or research masters, both here in Australia and in other countries with similar histories of colonisation. But what we noticed was that very few people were talking about the everyday realities, the small, often invisible acts of support, that can mean the difference between feeling isolated and feeling supported. For those working in sensitive areas like alcohol research, the challenges are even more complex. Emerging Aboriginal and Torres Strait Islander researchers are not only engaging with stigmatised topics, but sometimes with deeply personal or community-held trauma. And when we looked internationally, we found almost

nothing written about how best to support First Nations higher degree students focusing on alcohol. This is where the Centre of Research Excellence in Indigenous Health and Alcohol comes into the picture. From the perspective of one academic staff member and one clinician stepping into research as a trainee, we learned what genuine, culturally safe, and practical support can look like. Our journey together taught us lessons we believe can be shared and lessons that go beyond one program or one university, and that we hope will help shape the way future First Nations researchers are supported in Australia and around the world. By strengthening this support, we can not only grow research capacity, but also improve health outcomes for First Nations peoples, particularly in rural and remote communities where the need is often greatest.

Primary healthcare

PH1 - Factors influencing the recruitment and retention of primary health care nurses in rural and remote areas: An evidence-based approach. (Open)

**** WINNER OF BEST OPEN RESEARCH ABSTRACT ****

Ms Emily Murphy

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Background and aims: Over a quarter of the Australian population live rurally or remotely. As a result, many encounter multiple barriers to accessing healthcare and experience poorer health outcomes. The Australian government's focus on the National Health Priority Areas has identified nurse-led models of care as a catalyst for increased access to care. Primary health care nurses are at the forefront of this work, transforming how care is delivered and addressing the unmet health needs of local communities. Given the ongoing challenges of recruiting and retaining the health workforce, it is vital to undertake research that examines factors supporting retention especially in rural and remote areas. The Australian Primary Health Care Nurses Association (APNA) is delivering and evaluating a Commonwealth funded program focused on implementing 37 nurse-led clinics across the country. The aim of this presentation is to highlight the early findings focused on a deeper understanding of the experiences of primary health care nurses.
Method: To evaluate the nurse-led clinics has required the establishment of a specialised research network with extensive clinical experience. This has enabled active engagement and support of the nurses and nurse practitioners developing and delivering these clinics. The nurses are participating in data collection, and for some clinics, they are coresearchers in the evaluation. A qualitative descriptive approach employing semistructured interviews was utilised for this component of the evaluation.
Results: Building an experienced research team that centres the experiences of primary health care nurses has been vital to this project. Nurses identified a range of interconnected factors that influence their retention in primary health care. These include their connection to, and sense of responsibility to their communities, building patient engagement and rapport, a supportive workplace culture and lived experiences in rural and remote areas.
Conclusions: Recognising the value and expertise that Primary Health Care Nurses bring to their workplaces and communities, particularly in rural and remote areas, is an important step towards developing a health care system that is underpinned by a focus on addressing health inequities, prioritises continuity of care, and values sustainability.

PH2 - ePrescribing and Active Script List awareness and adoption across the Western NSW region (General)

Dr Catherine Keniry, A/Prof Melissa Nott

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Background and Aims: Electronic prescribing (ePrescribing, EP) was implemented in Australia in May 2020. An Active Script List (ASL) is a digital list of electronic prescriptions and became available soon after the release of ePrescription. The Western NSW Primary Health Network (WNSWPHN) was commissioned by the Australian Digital Health Agency to engage with primary healthcare providers and elucidate how general practitioners (GPs) use and promote EP and the ASL to their patients. The aim was to identify the barriers and motivations influencing GPs' utilisation and advocacy of these digital tools, and to seek insights on consumer engagement with EP and ASL. The rationale was to enhance medication safety, improve healthcare efficiency, and empower patients in Western NSW.
Methods: This study employed a mixed methods approach, incorporating a brief online survey followed by semi-structured online interviews. Recruitment was conducted by the WNSWPHN from May to July 2025, with interviews occurring from June to July 2025. Participants included registered GPs and GP registrars actively providing clinical services within the Western NSW region. Twenty-five participants completed semi-structured interviews.
Results: A large proportion (91%) of the sample reported currently using EP with at least some of their patients. Conversely, only a small number of GPs (11%) reported using ASL. No participants reported prior training for ASL. Overall, the participant group were digitally literate, had integrated EP and other digital tools into their regular practice, but had limited awareness of or adoption of ASL. Initial qualitative analysis of interview data revealed barriers to EP adoption and highlighted the need for improved patient education and targeted communication strategies. Older patients often resist digital solutions, while younger patients are more receptive. Barriers to ASL adoption include the pharmacy-driven enrolment model, technological challenges for older users, and perceptions of complexity. Despite the potential benefits, current promotional strategies are ineffective, necessitating targeted communication to enhance engagement.
Expected Outcomes/ Implications: The research is expected to innovate and advocate for health system improvement, including promoting adoption of digital health solutions. Finalisation of this analysis will confirm, enhance and provide additional perspectives and will also provide localised insights and recommendations to: i. help increase awareness and use of ePrescribing and ASL in the WNSWPHN region, ii. how best to transfer important messages about digital health to prescribing clinicians and patients living and working in rural and remote locations, and iii. highlight successes and lessons learned from this engagement study.

PH3 - Integrating Rural Community Screening Initiatives into the General Practice System – A Focus Group Qualitative Evaluation (General)

Dr Kam Cheong Wong

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Background and Aim: Diabetes and cardiovascular disease (CVD) are leading causes of morbidity and mortality in Australia, particularly among rural and underserved populations. Community-based outreach may help, but integration with GP workflows and medico-legal responsibilities remains a challenge. This study aims to test a co-designed digital feedback system that facilitates the exchange of screening
Results: between the Care2U mobile screening system and GPs, and vice versa, to enhance continuity of care. We also sought to explore the perspectives of service providers on the acceptability, feasibility, and sustainability of this integrated screening and communication model in rural settings.
Methods: A qualitative descriptive study using focus group methodology through the Critical Realism lens was conducted in April 2025. Participants included 12 stakeholders (i.e., 3 GPs, 3 nurses, 2 practice managers, 2 health informatics professionals, and 2 researchers). A semi-structured facilitation guide was used to explore perspectives on program design, implementation logistics, patient engagement, screening scope, data integration, and ethical considerations. Participants were recruited via the PenCS rural network, and WSU staff (KCW and ULO) conducted the FGD. All participants gave written informed consent before they participated in the project. A 91-minute focus group discussion (FGD) was conducted online, recorded, transcribed, and thematically analysed. The qualitative data was managed using NVivo software.
Results: Participants expressed strong support for the Care2U outreach model, particularly in addressing service gaps in remote and Indigenous communities. Key themes included: (1) Feasibility and Value of Outreach Programs, highlighting operational considerations and population benefit; (2) Patient Identification and Engagement, emphasising challenges in reaching patients without GP connections; (3) Scope and Modality of Screening, calling for broader health assessments and investigating the feasibility of remote heart rhythm monitoring; and (4) Communication, Workflow, and Responsibility for Findings, underscoring the importance of seamless data integration with GP software and the need to clarify duty of care and medico-legal responsibility. Concerns were raised about managing abnormal findings for patients without a regular GP, with suggestions including phased implementation targeting GP-affiliated patients and the use of telehealth support.
Conclusions: The Care2U model was perceived as highly valuable for improving chronic disease screening in rural settings. Successful implementation depends on interoperable data systems, clear delineation of clinical responsibility, and tailored outreach strategies. A phased rollout beginning with GP-affiliated patients may enhance feasibility and reduce medico-legal risks. These findings support the development of sustainable, integrated community-based screening programs in primary care.

PH4 - A simple screening test for recent low level exposure to DNA damaging agents such as organophosphate based pesticides. (General)

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Aim: Concerned with high levels of cancer in the Riverina area, this study investigated the possible impact that the suspected DNA damaging agents, organophosphate pesticides (OPs), might have on local farmers. We aimed to determine whether scoring microscopically visible nuclear fragments within red blood cells (Howell-Jolly bodies [HJB]) could demonstrate nuclear disruption caused by such agents, using blood obtained from a finger prick (FP). Usually damaged cells are naturally removed but some may survive becoming susceptible to further damage, causing disease.
Methods: Ethical guidelines were followed, questionnaires completed and blood samples collected from 77 male farmers from the Riverina district before and/or after OP use. Venepuncture (VP) and

FP samples were scored for HJB. VP samples were also tested for chromosome breaks (CB) within T lymphocyte metaphases, used as the reference test in this study. VP samples were also tested for plasma cholinesterase (ChE), the standard screening test for OPs.
Results: Most farmers admitted to some exposure events while using OPs but felt no side effects. VP and FP samples correlated well ($p<0.001$, $n=111$) as did the VP and FP compared to CB ($p<0.001$, $n=105$ and $p<0.001$, $n=105$ respectively). There were significant differences between the samples collected before and after OP use [VP HJB ($p<0.001$, $n=33$); FP HJB ($p<0.001$, $n=34$); CB ($p<0.001$, $n=32$)]. No statistically significant change in ChE was found ($p=0.11$, $n=34$), consistent that the test is only sensitive to overt poisoning.
Conclusion and implications: Scoring HJB from a FP sample has emerged as a potential simple, inexpensive and fast screening test for recent low level occupational exposure to OPs. As most farmers did not realise the impact of their OP use, screening is needed. Because a FP blood film can be prepared on site it has the advantage over VP that requires special storage conditions for later laboratory processing. As a non-specific test it may be applied to any suspected genotoxic agent both in rural and urban settings. It can be evaluated in any pathology laboratory by skilled microscopists even in remote areas. It may have a significant impact on the prevention of cancer and various neurological disorders by enabling safe handling or avoidance practices to be adjusted as required. Focusing on prevention rather than cure, the latent associated reductions in suffering and health care costs that this test offers, cannot be underrated.

PH5 - Usability and Acceptability of the High-Density Microarray Patch (HD-MAP) for Adult Vaccination: A Mixed Methods Study (Student)

Ms Shin Koay Teh

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Background & Aim: High-Density Microarray Patch (HD-MAP) vaccines may improve vaccine uptake through needle-free, user-friendly administration. The potential for self-administration could further enhance vaccine accessibility among geographically isolated populations. For successful implementation of HD-MAP technology, end users must be able to follow their group-specific Instructions for Use (IFU) and administer the HD-MAP accurately and confidently. The research questions were: What are the barriers and facilitators to successful HD-MAP administration, and what factors influence its acceptability among healthcare professionals (HCPs) and lay adults using group-specific IFU? The study aimed to evaluate the usability and acceptability of HD-MAP applicator administration among HCPs and lay adults in Western Sydney and Dubbo, using group-specific IFU.
Methods: This mixed-methods study utilised a single-group intervention approach. All participants completed two HD-MAP applicator administrations to the deltoid (upper arm), without the HD-MAP or vaccine. HCPs administered the applicator to an adult volunteer's deltoid using the HCP IFU, while lay adults self-administered it to their non-dominant upper arm using the lay adult IFU. Participants completed a demographic questionnaire, a semi-structured interview on usability and acceptability, and finger and hand strength testing. Usability was assessed against five essential criteria, with the proportion of participants meeting all five essential criteria presented. Interviews data were coded in NVivo12 and subject to thematic analysis.
Results: 67 participants were recruited: 25 HCPs and 42 lay adults. Both groups found HD-MAP applicator administration usable and acceptable, with group-specific IFU reported as easy-to-follow. Performance improved in the second attempt for both groups, with a higher proportion of lay adults meeting essential criteria across both attempts. All eight participants (four HCPs and four lay adults) who failed to activate the applicator in both attempts exhibited reduced finger strength. Both groups reported difficulty in understanding the force required to activate the applicator.
Conclusion: HD-MAP applicator administration demonstrated high usability and acceptability among HCPs and lay adults using group-specific IFU. Optimising IFU and applicator design may further enhance usability and acceptability.

Lightning Talks

LT1 - What influences access to care in regional NSW for patients with symptoms of multivessel coronary artery disease? (Emerging)

Ms Ashleigh Ralph

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Background & Aims: Cardiovascular disease (CVD) remains a leading cause of death in Australia, with significantly higher rates in regional and remote areas. Multivessel coronary artery disease (MVD), involving severe narrowing in multiple coronary arteries, is associated with increased morbidity and mortality. Timely access to specialised cardiovascular care is critical to improving outcomes, yet patients in Western NSW face systemic, geographic and socioeconomic barriers that delay diagnosis and treatment. A clinical audit at Dubbo Health Service revealed a high burden of disease, with 639 patients with coronary disease across 107 locations, with Dubbo accounting for 45% of cases. These findings highlight significant geographic disparities in disease burden and access to care.

This study aims to explore the factors influencing access to care for individuals with suspected MVD in the Dubbo catchment area of the Western NSW Local Health District (WNSWLHD). The research seeks to identify barriers and enablers to accessing cardiovascular services and inform strategies to reduce preventable hospitalisations and improve health outcomes.

Methods: This study uses a two-phase observational descriptive design.

Phase 1 involves retrospective analysis of de-identified patient data from the NSW Cardiac Outcomes Registry (NSWCOR PCI) and electronic medical records (eMR).

Phase 2 includes a patient survey using a modified validated tool based on the Levesque Conceptual Framework. The survey captures patient experiences related to healthcare access, affordability, continuity of care, and health literacy. Data will be analysed using descriptive statistics and multiple regression techniques.

Expected outcomes: At this stage, no results are available; however, preliminary audit data from Dubbo Health Service highlights significant geographic disparities in both disease burden and access to care. Data collection and analysis will commence following ethics approval. Retrospective data analysis will provide an overview of patient demographics, clinical presentations and treatment pathways as well as identification of significant relationships, trends, and potential predictors of delayed or limited access to care among patients with multivessel coronary artery disease. The survey phase will provide valuable insights into participant-reported barriers and enablers to accessing care.

Implications: This research will generate critical insights into the systemic and individual-level factors affecting access to cardiovascular care in regional NSW. Findings will inform the development of targeted, culturally appropriate interventions, such as community outreach and health education programs. The outcomes aim to support policy and service delivery improvements within WNSWLHD and similar health settings, contributing to broader efforts to reduce health inequities through collaborative rural research networks.

LT2 - The Western New South Wales Local Health District (WNSWLHD) 4Ts - a rural general practice model. (Emerging)

Dr Catherine Keniry

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Background & Aims: The health of a community is significantly influenced by a myriad of health and non-health determinants, which critically affect healthcare access, particularly in rural areas, where geographical isolation and resource limitations exacerbate health disparities. Workforce shortages further hinder healthcare delivery. Innovative models, such as telehealth and mobile health services, have emerged to address these challenges. The '4Ts' single employer model implemented by the WNSWLHD exemplifies a collaborative approach to healthcare integration, aiming to improve access and outcomes in rural communities. This model provides co-located primary and secondary healthcare to provide networked primary care across four communities; Tullamore, Tottenham, Trundle and Trangie within the WNSWLHD. This study will evaluate the impact of the 4T's model and explore community perspectives of the effects of the model for the four rural T-town communities.
Methods: A qualitative design using semi- structured interviews sought participant perspectives related to the 4Ts model - including access to services for medical emergencies; services for chronic disease management; satisfaction with service provision; satisfaction with addressing community needs and, perceived changes in socio-economic outcomes. Participants included patients accessing 4T's healthcare services in the four target communities, clinical and non-clinical staff providing care across the 4T's model, and community members within the target locations.
Results: Participant responses fell within four key themes; 1) the expectations of the community and feedback related to three aspects of service, specifically 2) service access, 3) service quality, and 4) service and outcomes. Participants identified a significant advantage of the 4Ts model in the flexibility of role interchangeability among the hospital, general practice, and the four communities. This interchangeability facilitates seamless collaboration among staff across different sites. Both staff and patients agreed that the presence of an emergency service in the community contributed to a heightened sense of safety. It was noted that the absence of such a service could lead to a considerable number of individuals relocating from the area.
Implications: This study elucidates the critical significance of healthcare access in small rural communities, as perceived from the community's perspective. It emphasises essential global factors that contribute to the efficacy of healthcare delivery, such as continuity of care and active community engagement. The research specifically examines the impact of the 4Ts model on the provision of healthcare services within the community. The 4Ts model may offer a scalable and replicable framework for other communities experiencing comparable challenges related to healthcare service access and workforce.

LT3 - Embedding Schwartz Rounds in Rural Health Education: A Scoping Review to Support Interdisciplinary Workforce Wellbeing. (General)

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Background and aims: Sustaining a resilient and self-sufficient rural health workforce requires more than clinical competence, it demands emotional support, reflective practice, and collaborative learning environments. Schwartz Rounds, a structured forum for reflective dialogue, have demonstrated success in enhancing wellbeing and professional identity among healthcare professionals. This scoping review explores their implementation in university settings internationally, with the aim of informing their integration into rural and regional Australian health education programs.

Methods: Following the Joanna Briggs Institute scoping review methodology and Arksey and O'Malley's framework, we systematically reviewed academic and grey literature, including journal articles, university websites, and blogs. Sources were analysed to identify practices, processes, and outcomes associated with Schwartz Rounds in higher education contexts, with a focus on interdisciplinary engagement and rural relevance.
Results: Findings indicate that Schwartz Rounds contribute positively to emotional resilience, professional identity formation, and retention among healthcare students and staff. Successful implementations involved collaboration between universities and health services, structured facilitation, and regular reflective sessions. These elements were particularly effective in rural contexts, where isolation and workforce pressures are more pronounced. The review also identified models that support interdisciplinary participation, including train-the-trainer approaches and integration into wellbeing strategies.
Implications or Conclusion: Integrating Schwartz Rounds into rural health education offers a scalable, evidence-informed strategy to support the wellbeing of future healthcare professionals. Embedding these rounds in university programs not only enhances student wellbeing and retention but also prepares graduates for entry into rural health services where Schwartz Rounds are already in place. This alignment strengthens continuity between education and practice, reinforcing reflective cultures and supporting workforce sustainability. Policy implications include the need to invest in wellbeing infrastructure, embed reflective practice into curricula, and support collaborative models that foster interdisciplinary engagement. Schwartz Rounds can play a critical role in building and sustaining a resilient rural health workforce.

LT4 - Building Research Capacity and Capability Among Nurses and Midwives in Rural and Regional Health Services: A Systematic Review. (General)

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Background: Nurses and midwives in rural and regional areas are uniquely positioned to address local health inequities, yet they remain underrepresented in research. Enhancing their research capacity is essential to improving healthcare outcomes and fostering evidence-based practice in underserved communities.
Aim: To synthesise current evidence on the barriers and facilitators influencing the development of research capacity and capability among nurses and midwives in rural and regional settings.
Methods: A systematic review was conducted following PRISMA 2020 guidelines. Five databases were searched, yielding 816 records. After screening and quality appraisal using the Mixed Methods Appraisal Tool (MMAT), nine peer-reviewed studies published between 2000 and 2025 were included. Studies varied in design and were conducted across Australia, the United States, Norway, Denmark, and Kosovo.
Results: The nine included studies highlighted key barriers such as time constraints, limited funding, inadequate access to resources, and apprehension toward research. Facilitators included strong leadership, interprofessional collaboration, and tailored educational interventions. Organisational support was consistently identified as a critical enabler of research engagement. Educational programs, journal clubs, and mentorship models were effective in enhancing research skills and confidence.
Conclusion: Targeted strategies and supportive infrastructures are vital to cultivating a sustainable research culture among rural and regional nurses and midwives. This review underscores the importance of context-specific interventions that address local challenges and promote equitable research participation.

LT5 - From Program Logic to Data Collection and Reporting Plan: Steps for planning program evaluation. (Open)

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Background and aims: Evidence of effective health programs is very important, however relatively little is generated within rural contexts. Clinicians and health program managers are often well placed to lead evaluation activities but may not be familiar with evaluation methods. This poster provides an overview of a simple step-by-step process for planning health program evaluation and demonstrates a method for developing Data Collection and Reporting Plans from Program Logic documents.
Method: The steps for evaluating a health program can include 1. Understand the expectations of key stakeholders, 2. Develop a Program Logic, 3. Develop a data collection plan, 4. Implement the data collection plan, 5. Analyse data and 6. Report findings. This poster presents an outline of simple worksheets to support the development of a Data Collection plan.
Results: Two separate tables can be used to operationalise a Data Collection Plan from a Program Logic. The first is a worksheet table displaying the key elements identified from the Program Logic in the rows (e.g. Outputs/Activities, Outcomes short term, medium and long term) and with columns noting what information should be collected, from who or where the information will be sourced, how it will be collected, by who and when. The second table presents the information generated in the first worksheet in a clean format ready for implementation. This Data Collection Plan table lists each of the evaluation/outcome measures and methods as rows, and the columns identify who will provide the information, who will collect it, by when. An additional Reporting Plan table can then be constructed with the elements of the Program Logic as rows and with examples of information for each key area as a column. A simple worked example is provided to show how these tables may be completed.
Conclusions: This simple step-by-step method has been utilised to plan evaluation activities across a range of Marathon Health's health and wellbeing programs. Further information can be accessed via a QR code from the poster to our article in the Australian Journal of Rural Health (open access).

LT6 - Connecting Disciplines, Bridging Distances: DACRIN's Member Affiliate Model for Rural Research Collaboration. (Open)

Ms Michelle Hall

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The Drug and Alcohol Clinical Research and Improvement Network (DACRIN) is a statewide clinical research network affiliated with the Australian Clinical Trials Alliance. Established to address fragmentation in alcohol and other drug (AOD) research across New South Wales, DACRIN supports 17 member organisations—including Local Health Districts, NGOs, universities, and NSW Health—with a strong focus on rural, regional, and remote service inclusion.
DACRIN's core function is facilitation. It does not conduct research directly, but enables member organisations to do so by providing shared infrastructure, governance, and capacity-building support. This includes access to research tools, training, and a centralised SharePoint platform. DACRIN is

coordinated by a single full-time Statewide Coordinator, funded by the NSW Ministry of Health, who supports collaboration across disciplines and locations.
A key feature of DACRIN's model is its Member Affiliate process, which allows individuals from member organisations to register and access DACRIN resources. With nearly 300 affiliates—including nurses, allied health professionals, medical practitioners, researchers, and other healthcare workers—DACRIN fosters interdisciplinary collaboration across clinical and research domains. This model has enabled rural staff to participate in multisite studies, co-author publications, and contribute to research aligned with local priorities.
DACRIN's approach directly supports the WHRN 2025 Symposium theme: "Building Research Networks: Collaborative Approaches to Rural Health Research." By connecting professionals across disciplines and geographies, DACRIN strengthens rural research capacity and promotes equity in research participation. Its scalable, low-barrier model offers a practical framework for other networks seeking to build sustainable, inclusive research ecosystems.

LT7 - Developmental care rounds for pre-term and at-risk infants admitted to inpatient wards: A Scoping Review. (Student)

Ms Jessica Mepstead

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Background Premature and at-risk infants are at increased risk of neurodevelopmental impairment. Mothers residing in a rural area are more likely to experience preterm birth. Inpatient developmental care interventions support neurodevelopment yet access is difficult in a rural setting. The developmental care round (DCR) is a service delivery model for implementing developmental care in inpatient settings.
Aims Identify the peer reviewed literature describing the use of DCRs for premature and at-risk children in inpatient settings, key components of DCRs in practice and elements and frameworks of developmental care.
Methods The review followed Joanna Briggs Institute methodology for scoping reviews. A systematic search of Scopus, Maternity Infant Care Database, MEDLINE, Embase, Web of Science and CINAHL was conducted to identify peer-reviewed articles that describe DCR. Articles were screened independently by two reviewers using predefined eligibility criteria. Data was extracted by one reviewer and presented in tabular and narrative form.
Results There were 672 articles identified and 11 articles included in the final review. All studies were undertaken in an urban hospital, mostly a cardiac intensive care unit. No rural studies were identified. Six surveys, five audits and 3 descriptive reviews were described. DCR were found to be helpful by staff and families for implementing developmental care. The most frequently implemented element of developmental care in DCRs was environmental change i.e. light and sound. Five studies utilised a formal neurodevelopment care framework.
Implications The body of literature for DCR is heterogenous. The results show variation components and service methods of DCR implemented across sites. Lack of consistent framework for care limit the ability to compare outcomes between sites. Research into a standardised protocol for DCR and evaluation on short- and long- term outcomes for infants is needed. There is a gap in the literature for applying DCR in a rural setting and utilising frameworks for developmental care.

LT8 - How "Metrocentric" is ENT/Head and Neck Surgery: A "Birds eye view" Scoping review (Student)

Ms Margot Robertson

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Background: Ear, nose and throat (ENT) and head and neck surgery is a broad specialty encompassing a range of conditions with risk factors such as higher smoking rates, obesity and

chronic disease being more prevalent in rural and remote populations1, 2. Yet, ENT research remains highly metrocentric potentially exacerbating health inequities by limiting evidence relevant to the rural context.
Objective: This scoping review aimed to quantify and map the representation of rural, remote and regional research within Australian ENT and head and neck surgery literature over the past 25 years, identifying trends and highlighting research gaps.
Methods: This review followed the Joanna Briggs Institute methodology and reporting was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA ScR). Systematic searches across MEDLINE, Embase and Scopus identified peer-reviewed papers from January 2000 onwards. Two reviewers independently screened data using Covidence which was then extracted according to the variables: publication year, mention of rurality within the text and abstract and explicit geographical focus. Descriptive statistics and temporal analyses explored trends and patterns within the dataset.
Results: A total of 936 studies were included, of these 19.8% mentioned rural, remote or regional contexts and 8.1% referenced these themes within the abstract. Over half (55.2%) focused exclusively on metropolitan areas, while rural (2.8%), remote (3.0%), and regional (4.0%) contexts were minimally represented. Although publication volume increased over time, this was not reflected in greater rural research engagement showing persistent metrocentricity.
Conclusions: These findings demonstrate that ENT and head and neck surgery literature remains overwhelmingly metropolitan in focus, despite nearly 30% of Australians living outside major cities2. This underrepresentation limits the understanding of rural needs, constraining evidence-based workforce and service planning.

LT9 –Patient perspectives of head and neck cancer in a rural context: A scoping review. (Student)

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Background and Aim: Rural patients face unique barriers in accessing care for head and neck cancer (HNC). Assessing patient perspectives using validated measures can help improve delivery of healthcare. The review maps the current literature around the patient perspectives of head and neck cancer in a rural setting, focussing on how research is being conducted globally.
Methods: Articles were reviewed from Medline, Embase, CINAHL, Scopus between January 2009 until July 2025, in accordance with JBI scoping review guidelines. Article screening and data extraction was performed by two authors.
Results: Twenty-seven articles were included, with a range of validated patient reported measures (PRMs) and qualitative findings from interviews and surveys. Studies were mostly from Australia. (48%) Patient's reported difficulties in pre-diagnosis period in accessing diagnosis and early treatment, impacting their health in a negative way. Rural patients were more open to telehealth appointments as they reported an improved care experience and reduced costs for patients. In person appointments allowed for a greater understanding of their diagnosis as well as appointment experiences, but a lack of continuity of care was concerning for patients. After diagnosis, rural patients reported significant levels of pain, mental health burden and financial burden.
Implications: Rural HNC patients face disadvantage from before diagnosis into the post-treatment and survivorship phase of their disease experience. Information derived from patient perspectives should be used to continue to optimise healthcare delivery to rural HNC patients as their needs are unique compared to their urban counterparts. The use of patient reported measures in routine healthcare should be intentional and continue to be investigated.