Out-foxing mpox: A 2022 retrospective case series in metropolitan Melbourne's North-East	**AHMED,H; MAIN,S; OSBORNE,A; RAVIDRAN,B; STONE,K; OLIVER,R; STREETON,C; TRAN,S; VAN DIEMEN,A**	**NEPHU**
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Comparing the diagnostic performance of calcium score and functional tests for chest pain assessment	AL-FIADH,Hussein; SHAWKI,Marwan; AZZOPARDI,Robert; SANDERS,Karen; LIU,Felix; LIN,Steven; FAROUQUE,Omar; AL-FIADH,Ali	Cardiology
Prognostic utility of plasma p217+tau vs amyloid and tau PET in the Alzheimer continuum	Azadeh Feizpour, Vincent DorÃ©, James D. Doecke, Ziad S. Saad, Gallen Triana-Baltzer, Natasha Krishnadas, Christopher Fowler, Larry Ward, Ralph N. Martins, Colin L. Masters, Victor L. Villemagne, Jurgen Fripp, Hartmuth C. Kolb, Christopher C. Rowe	Molecular Imaging and Therapy
Rapid Access Chest Pain Clinic (RACPC); Impact of Patient Factors on Initial Investigation Choice - CTCA vs. TSE	AZZOPARDI, R. SHAWKI, M. AL-FIADH, H. LIU, F. LIN, Y. PETRUS, F. BRISBANE, N. AL-FIADH, A	Cardiology
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The impact of branched-chain amino acids on sarcopenia in cirrhosis; a randomised-controlled trial.	HEY, P; HOERMANN, R; CHAPMAN, B; SINCLAIR, M; TESTRO, A; APOSTOLOV, R; GOW, P	Gastroenterology
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	LEE. EF	School of Agriculture, Biomedicine and Environment
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		Liver Transplant Unit (LTU)
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Rapid access chest pain clinic; insights from 10 years of an Australian experience.	SHAWKI,M; AZZOPARDI,R; AL-FIADH,H; LIU,F; LIN,Y C, ZOUMBERIS,C; SANDERS,K; FAROUQUE,O; AL-FIADH,A	Cardiology

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Out-foxing mpox: A 2022 retrospective case series in metropolitan Melbourne's North-East

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Background
The North Eastern Public Health Unit (NEPHU), managed its first case of mpox in July 2022. We conducted an epidemiological investigation of cases and contacts to support local elimination.

Methods
A case series was conducted of laboratory confirmed mpox cases in the NEPHU catchment in 2022. This included clinical and laboratory investigations, case interviews and contact follow up.

Results
24 confirmed cases were notified in the NEPHU catchment in 2022. 23 cases identified as male (96%), 1 as gender fluid (4%) with a median age of 37 years (range: 24-52). Rash (n=21), fever (n=14), and myalgia (n=11) were the most common symptoms reported, and 4 cases (17%) self-reported living with HIV. Three (13%) cases had received one vaccine dose prior to symptom onset. 5 (21%) were admitted to hospital. No deaths were reported.

All cases reported male sexual contact in the exposure period and 18 (75%) had multiple sexual partners (MSPs). Of the 24 cases, transmission for eight (33%) cases was determined to be through sexual contact overseas and 16 (67%) were locally acquired. Among locally acquired cases; four (17%) were acquired through sexual contact with an mpox case in Victoria and 12 (50%) cases' acquisition sources were unable to be determined. Of those unable to be determined; five reported attending a sex on premise venue or engaging in anonymous group sex, and nine reported having MSPs.

30% of downstream contacts of cases were classified as high risk (n=32/108), of which 53% were sexual contacts (n=17/32). Five of those sexual contacts subsequently became confirmed cases.

Conclusion
This outbreak was concentrated in a sub-population of young men who had multiple male sexual partners. Public health actions and epidemiological investigations conducted by NEPHU aided the local elimination of mpox in our catchment, through prioritization of prevention and control measures.

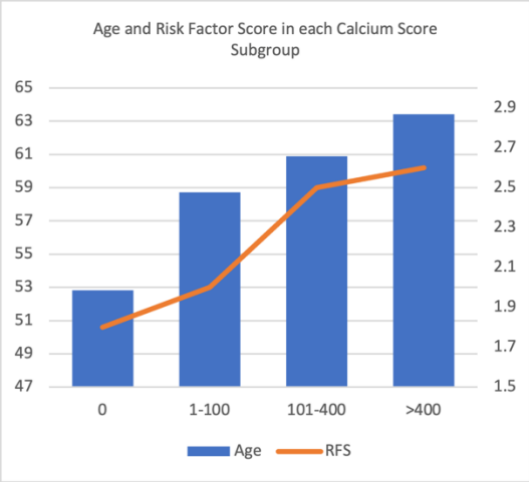
Comparing structural and functional tests for diagnosis of coronary artery disease; an evaluation of diagnostic accuracy

Introduction: The optimal first line-test remains uncertain in Rapid Access Chest Pain Clinic (RACPC). This study aimed to analyse trends in calcium score and compare data from patients undergoing structural vs functional tests as the first test.

Methods: A retrospective analysis was conducted on patients attending RACPC over 6 years. The study analysed 2396 patients with a subgroup analysis of calcium score, ranging from 0 to >400. A risk factor score (RFS) was created based on hypertension, type 2 diabetes, dyslipidaemia, smoking, and family history of IHD. Patients were stratified based on their RFS of 0-2 (low risk) and 3-5 (high risk).

Results: The study findings suggest that patients with higher calcium score tend to be older with multiple risk factors (table). Furthermore, of the 304 patients with high RFS who underwent functional assessment as first test, 239 (78.6%) patients had negative results, indicating low probability of CAD. However, four secondary visits were observed, with one patient requiring percutaneous coronary intervention after ST elevation myocardial infarction.

	0	1	2	3	4	5	RFS	Age
0 (n = 767)	49	120	149	75	18	6	1.8	52.8
1-100 (n = 239)	25	52	90	47	21	4	2.0	58.7
101-400 (n = 122)	2	17	42	42	17	2	2.5	60.9
>400 (n = 74)	5	12	17	23	14	4	2.6	63.4



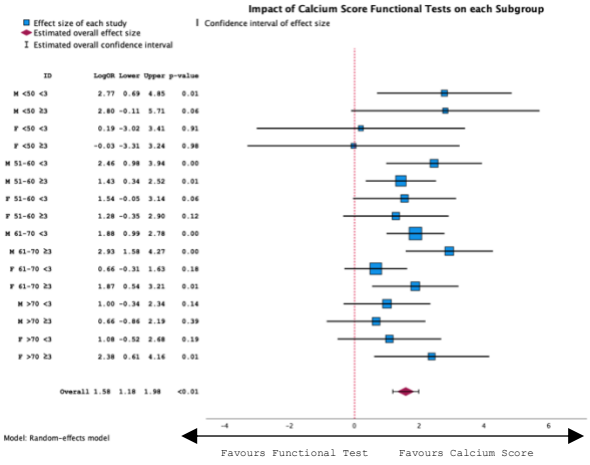
Conclusion: Functional testing may not be the ideal test for patients with an RFS of ≥3 and negative results should be interpreted with caution. The study highlights the importance of choosing the appropriate first-line test in patients with suspected CAD to avoid false-negative results and to ensure timely management.

Comparing the diagnostic performance of calcium score and functional tests for chest pain assessment

Introduction: Selection of the appropriate test in the Rapid Access Chest Pain Clinic (RACPC) is a critical juncture in the assessment of patients with a risk of underlying Coronary Artery Disease (CAD). This study aimed to identify the impacts of diagnostic tests.

Methods: The study analysed 2396 patients with a subgroup analysis of age and gender. A risk factor score (RFS) was created based on hypertension, type 2 diabetes, dyslipidaemia, smoking, and family history of IHD. Patients were stratified based on their RFS of 0-2 (low risk) and 3-5 (high risk). 16 categories were produced each labelled [sex, age group, risk factor group]. In each group, positive (>100) and negative (≤100) calcium score and functional tests were collected and inputted into SPSS, generating forest plots.

Results:



Conclusion: The forest plot shows that calcium score was favoured over functional test. Overall results showed a LogOR of 1.58. Converting this to an OR using a calculator generated a 4.86x likelihood of detecting underlying CAD utilising calcium score over functional test. This study highlights the value of individualised testing depending on patient characteristics to improve diagnostic precision. The development of a flow chart to assign patients to certain tests based on risk factors and features may help the RACPC manage patients efficiently.

Azadeh Feizpour[1,5], Vincent Doré[1,2], James Doecke[3], Ziad Saad[4], Gallen Triana-Baltzer[4], Natasha Krishnadas[1,5], Christopher Fowler[5], Larry Ward[5], Ralph Martins[7,8], Colin Masters[5], Victor Villemagne[1,9], Jurgen Fripp[3], Hartmuth Kolb[4], Christopher Rowe[1,5,6]

Prognostic utility of plasma p217+tau vs amyloid and tau PET in the Alzheimer continuum

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Aim
We aimed to evaluate the association of plasma p217+tau — a novel phosphorylated tau (p-tau) biomarker representing brain amyloid-β (Aβ) and tau pathology — with longitudinal cognition and its comparative performance to Aβ and tau PET in predicting prospective cognitive decline.

Methods
153 cognitively unimpaired (CU) and 50 cognitively impaired (CI) participants underwent baseline p217+tau SIMOA assay, ^{18}F-MK6240 tau-PET and ^{18}F-NAV4694 Aβ-PET with neuropsychological follow-up (MMSE, CDR-SB, AIBL-PACC) over 2.4 ± 0.8 years. The association of baseline biomarkers with cognitive decline was evaluated. Sample size to detect a 30% slowing in cognitive decline in a 2-year trial and selection cost using p217+tau (pT+) were compared to Aβ-PET (A+) and tau-PET (T+) with and without p217+tau pre-screening.

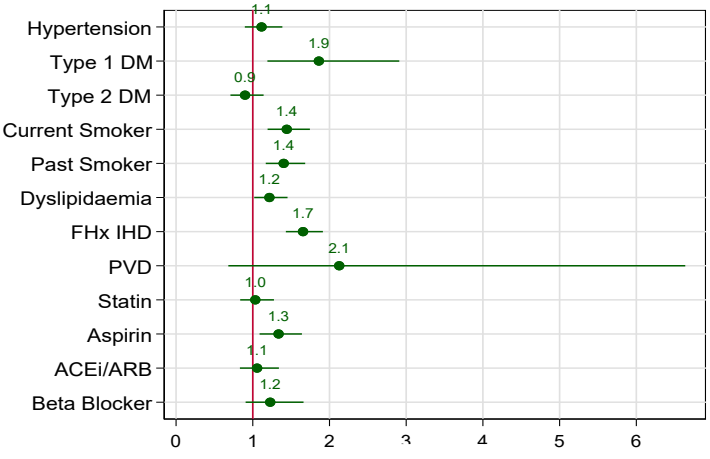
Results
In the CI, plasma p217+tau predicted change in MMSE (β = -0.55, $p < 0.001$) and CDR-SB (β =0.61, $p < .001$) with effect size larger than Aβ Centiloid (MMSE β = -0.48, $p = 0.002$; CDR-SB β = 0.43, $p = .004$) but smaller than tau_{MetaT} SUVR (MMSE: β = -0.62, $p < .001$; CDR-SB: β = 0.65, $p < .001$). In the CU, only tau_{MetaT} SUVR predicted change in AIBL-PACC (β = -0.22, $p = 0.008$). Screening CI for pT+ led to 24% reduction in sample size compared to screening with PET for A+ and 6-13% compared to T+ (different regions). This translated to an 80% test cost-saving assuming p217+tau costed one-fifth of PET. In a trial requiring PET T+ or A+, pT+ pre-screening followed by PET would cost more in the CI group with AD prevalence of 70%, compared to 35% cost-saving in the CU group with preclinical AD prevalence of 25%.

Conclusion
Substantial cost reduction can be achieved using p217+tau alone to select participants with CI for a trial, compared to selection by PET. Pre-screening with p217+tau followed by PET provides cost-saving in preclinical trials but is questionable in MCI/AD trials.

Rapid Access Chest Pain Clinic (RACPC); Impact of Patient Factors on Initial Investigation Choice - CTCA vs. TSE

Background: Rapid Access Chest Pain Clinic (RACPC) is a successful new model of care. The effect of a patient's clinical information on selecting investigations and detecting coronary artery disease (CAD) in an RACPC setting is yet to be determined.
Methods: A retrospective cohort study was conducted on the RACPC between 2012 and 2022. Descriptive analysis was performed to find the distributions of number of traditional cardiovascular risk factors being present or cardiovascular medications being used for those receiving TSE or CTCA as a first line investigation. Statistical analysis was performed via multiple logistic regression with the binary outcome of CTCA being chosen over TSE as a first line investigation to assess the effect of a patient's characteristics on the choice of the investigation. A systematic approach was taken to find a multiple logistic model that best suited the dataset. Odds ratios are displayed for binary variables.
Results: A higher proportion of the CTCA cohort had 2 or more risk factors being present or 1 or more cardiovascular medications being used when compared to the TSE cohort. The TSE cohort had 50.0% (926/1850) of their group with 0 or 1 cardiovascular risk factors compared to 31.8% (523/1643) of the CTCA cohort. The TSE cohort had 61.1% (1131/1850) with 0 cardiovascular medications compared to 43.4% (714/1643) of the CTCA cohort. The multiple logistic regression model results for binary variables are demonstrated in Figure 1. The outcome of interest was choosing CTCA over TSE as a first line investigation. Age and gender were found to have interaction. Being male resulted in increased probability of choosing CTCA over TSE. Up to 67 years of age, increasing age resulted in increased probability of selecting CTCA. Over 67 years of age, increasing age resulted in decreased probability of selecting CTCA.
Conclusion: Traditional risk factors, male gender, and the use of cardiovascular medications were associated with an increased likelihood of choosing CTCA over TSE as the first line investigation. The impact of age on the choice between CTCA and TSE varied. For patients below 67 years of age, increasing age corresponded to an increasing probability of selecting CTCA over TSE. However, for patients aged 67 and above advancing age was associated with a gradually decreasing likelihood of opting for CTCA compared to TSE.

Figure 1: Choosing CTCA over TSE – Odds Ratios



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Evaluating feasibility of a secondary stroke prevention program.

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Aim: While 80% of strokes are preventable, stroke continues to be the second leading cause of disability and death worldwide, affecting over 445,000 people in Australia[1]. Having a stroke increases risk of further stroke. Healthy lifestyles including exercise and diet can reduce the risk of stroke[1], but stroke survivors often lack guidance to modify their lifestyle after hospital discharge. Our aim was to evaluate the implementation of a secondary stroke prevention program involving exercise and education for people with mild stroke or transient ischaemic attack.

Methods: We implemented a new group-based program involving multidisciplinary education, supervised exercise, and telehealth coaching to reduce modifiable stroke risk factors. We evaluated feasibility by collating service information (referrals, uptake, participant demographics), and consumer acceptability (satisfaction and attendance). Clinical outcomes examined self-reported change in lifestyle factors, and pre-post scores on standardised tests, [e.g., waist-circumference, 6-Minute-Walk (6MWT), Fatigue-Severity-Scale (FFS)].

Results: We ran seven programs in 12-months. Of 90 referrals, 37 people participated, 10 were wait-listed, 28 received an alternative program, and 15 were not suitable (medical, technology, not indicated). The education session attendance was 79%, and 34/37 participants completed the program. No adverse events occurred. Consumer satisfaction was high (strongly agree & agree) for 'relevance' (100%), 'would recommend to others' (96%), 'felt safe to exercise' (96%) and 'intend to continue' (96%). Most participants (89%) changed (on average) 2.5 lifestyle factors (diet, exercise, smoking, alcohol). 92% of participants achieved the recommended levels of physical activity for healthy living. Potential clinical benefits were observed for 6MWT (MD 59m, 95%CI –33m to 159m), FFS (MD –1/7, 95%CI –3.6/7 to 1.7/7) and waist-circumference (MD –2cm, 95%CI -4cm to 1cm).

Conclusion: The program was feasible to deliver, acceptable to consumers and seemed beneficial for health. Access to similar programs may assist in secondary stroke prevention.

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1. The Stroke Foundation of Australia website www.strokefoundation.org.au

Functional Neurological Disorder in Transgender People: A Case Series

Background
Functional neurological disorder (FND) is far more common in women, though it is unclear whether this is an effect of gender or sex. If FND occurs in transgender people, it may help us to understand the contributions of sex and gender in FND.

Methods
Information on transgender patients from our FND clinic was gathered from medical records, and comparison made with our cisgender patients.

Results
Nine of 282 (3%) of the people with FND in our clinic identified as transgender. Seven of the nine were born biologically female. Six developed FND after they transitioned. All 9 were receiving oestrogen, either endogenous or exogenous, at the time they developed FND. Transgender patients were more likely to be younger, have a psychiatric comorbidity, and a history sexual abuse compared to cisgender patients of the FND clinic.

Conclusions
Transgender may be overrepresented in FND populations, perhaps as a result of significant adversity and co-morbidity. In our sample it largely occurred in people born female, and only in those who had endogenous or were receiving oestrogen.

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Cerebral Haemodynamics and Orthostatic Response to Upright position in acute ischaemic Stroke: the CHORUS study

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Aim
The effects of upright positions on cerebral haemodynamics in acute ischaemic stroke are not well understood. A potential mechanism for harm is that upright activity (sitting, standing, walking) could worsen cerebral perfusion early post ischaemic stroke. We aimed to estimate the effects of upright positions (sitting, standing) on cerebral haemodynamics in people with acute ischaemic stroke, with and without occlusive disease.

Methods
We prospectively recruited participants with acute ischaemic stroke (<48h symptoms onset) with or without occlusive disease, and controls. We investigated MCA mean velocity (MV) using transcranial Doppler from 0° head position to 30°, 70°, 90° sitting, and 90° standing, at <48h and 3-7days post-stroke. A blinded assessor determined MV. Mixed-effect linear regression was used to analyse changes in MV and logistic regression to explore associations between MV and 30-day functional outcome (modified Rankin Scale).

Results
Forty-two stroke participants (13 with occlusive disease, 29 without, median NIHSS 4 (IQR 2-10)) and 22 controls were recruited. MV decreased in the affected hemisphere in both stroke with occlusive disease (<48h) between 0° and sitting (-9.9cm/s, 95%CI [-16.4,-3.4]) and standing (-7.1cm/s, 95%CI [-14.3,-0.01]), and in those without occlusive disease from 0° to sitting (-3.3cm/s, 95%CI [-5.6,-1.1]) and standing (-3.6cm/s, 95%CI[-5.9,-1.3]) (p-value for interaction between stroke with and without occlusive disease=0.07). Similar changes were observed in controls (0° to sitting -3.8cm/s, 95%CI [-6.0,-1.63] and standing -3cm/s, 95%CI [-5.2,-0.81]) (p-value for interaction between stroke and controls=0.85). Changes in MV in stroke participants <48h was not different to 3-7days. No association between changes in MV <48h and 30-day modified Rankin Scale was found.

Conclusion

Moving to more upright positions in the first 2 days post-stroke does reduce mean velocity, but these changes were not significantly different for people with stroke with and without occlusive disease, neither between stroke and controls.

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The suitability of the Hypoxico Hyp123 Altitude Generator as a low oxygen delivery method for therapeutic acute intermittent hypoxia research trials.

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Aim

Therapeutic acute intermittent hypoxia (tAIH) is a novel treatment which may improve motor function for people with spinal cord injury through hypoxia-induced neuroplasticity. Commercially available "altitude generators" are used to generate low oxygen concentration (%O_2) air for tAIH, but variable output has been noted. We aimed to test the flow characteristics and suitability of the Hyp123 Altitude Generator for use in clinical tAIH trials.

Methods

Output was sampled from the Hyp123 Altitude Generator (Hypoxico) using a digital oxygen sensor (FDO_2, PyroScience) and pneumotachograph (3700A, Hands Rudolph) connected to a data acquisition system (Spike7, Cambridge Electronic Design). The generator was commenced at room air (21%O_2, time=T_0) for two-minutes and then adjusted to deliver a target 9%O_2 with time taken to reach mean response time (T_{90}) recorded. Output (%O_2 and flow (L/sec)) at steady-state (T_{steady}) was collected for five-minutes. Data are presented as mean ± standard deviation, range [min-max], and variability assessed using the coefficient of variation (CoV).

Results

Mean response time from 21%O_2 to 9%O_2 was 69.0±4.8 seconds, with time to steady-state 182.2±10.6 seconds. Minimal variability (CoV=0.01) was observed, with T_{steady} O_2% of 9.0±0.1 [range 8.8-9.2%]. This suggests achievable generation of low oxygen concentration air with minimal variability; however, the response time exceeds commonly used tAIH protocols of 60-second hypoxic episodes with 1-2 minute room air intervals. Airflow at 9%O_2 generated a sinusoidal wave (2.5 second period) with 14.6L/min trough and 47.4L/min peak flow rates (mean 29.3±0.4L/min; CoV=0.3). These variable flow rates and trough values may be insufficient to meet an adult's inspiratory flow rate during tidal breathing.

Conclusion

Commercially available altitude generators may be unsuitable or require adapting for tAIH research and translation to clinical environments. Data collection on human participants should also be investigated as impact of variable flow on physiological response is unknown.

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Photovoice to explore the patient experience of a relative motion orthosis following a hand injury.

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Aims: Little is known about the patient experience relative motion (RM) orthoses or how they impact hand use and participation in occupational roles. This study aims to explore the use of Photovoice methodology in hand-injured patients and the patient experience of wearing a RM orthosis.

Method: Purposive sampling was used to identify adult patients with acute hand injury, who had been prescribed a RM orthosis. For 2 weeks participants captured photographs reflecting their experience wearing a RM orthosis and its impact on their daily life. Participants shared 15-20 photos with the researchers. At a face-to-face semi-structured interview 5 key photographs were selected by the participants with context and meaning explored. Interview data was transcribed and thematic analysis completed.

Results: Three participants (aged 22-46 years) shared 42 photos and completed individual interviews. All participants reported their involvement as a positive experience. Six themes were identified: adherence, orthosis factors, expectations and comparisons, impact on daily activities, emotions, and relationships. RM orthoses allowed freedom of movement enabling participation in a range of occupations. Challenges included water-based activities, computer use and kitchen tasks. Participants expectation of orthosis wear and recovery appeared to contribute to their overall experience, with RM orthoses viewed favourably when compared to other orthoses and immobilization methods.

Conclusions: Photovoice methodology was a positive process for participant reflection and a larger study is recommended. Wearing a RM orthosis enabled functional hand use as well as providing challenges completing everyday activities. Participants had different demands, experiences, expectations, and emotions, reinforcing the need for clinicians to take a client-centred approach to prescription, fabrication, and occupational modification for patients with an RM orthosis.

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Application of real-world clinical data to understand the profile of arm weakness, pre-stroke outcomes and other impairments early post-stroke.

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Background: The profile of upper limb weakness and other impairments early post-stroke may be changing. Examining the assessment completed within 24-48 hours post-stroke, recommended by the Australian Stroke Guidelines, may build an understanding of the current profile. Such an assessment can provide real-world data benefits for clinical (e.g., profile of impairments, service delivery changes) and research (e.g., recovery phenotypes) practice.

Aims: Primary aim was to determine the upper limb motor weakness profile, with a secondary aim to contextualise this profile by examining pre-stroke outcomes, other post-stroke impairments, and discharge destination.

Methods: Cross-sectional observational study. Data were extracted from the electronic medical record of a consecutive sample admitted to an acute stroke unit over 15 months. The Shoulder Abduction and Finger Extension (SAFE) score was the primary measure of upper limb weakness. Demographics (e.g., age), clinical characteristics (e.g., National Institutes of Health Stroke Scale NIHSS), pre-stroke outcomes (e.g., Clinical Frailty Scale), other post-stroke impairments (e.g., command following), and discharge destination were also extracted.

Results: 463 patients had a confirmed stroke and SAFE score (median: 74-years; NIHSS 5. 90% ischaemic). One-third of patients received ≥1 acute intervention(s). Nearly one-quarter of patients were classified as frail pre-stroke. Upper limb weakness (SAFE≤8) was present in 35% at a median of 1 day post-stroke, with most categorised with mild-moderate weakness (SAFE5-8). The most common other impairments were upper limb coordination (46%), delayed recall (41%), and upper limb sensation (26%). After a median 3-day acute admission, 52% of patients were discharged home.

Conclusion: The impairment profile was heterogenous early post-stroke. While fewer patients are presenting with upper limb motor weakness than in well-cited studies from 20 years ago, many are presenting with premorbid clinical frailty. To identify meaningful recovery phenotypes, further research is required to tease out the impact of pre- and post-stroke impairments.

Background: Post operative atrial fibrillation (POAF) is a clinically significant event that affects mortality and morbidity. There is limited local data in Australia of the incidence and the impact POAF has on their clinical course.

Methods: A retrospective analysis was conducted in patients over the age of 18 years who had non-cardiac and non-thoracic surgery between January 2021 – June 2022 to understand the incidence of post operative AF. Demographics of these patients and secondary outcomes including mortality, readmission to hospital, heart failure and commencement of anticoagulation were analysed.

Results: Between January 2021 and June 2022, 78 patients had an episode of post operative atrial fibrillation out of a total 33138 surgeries being conducted in this time frame (0.24%). POAF was more common in those with: an older age (median age 77 years), male sex (57.69%), and history of hypertension (70.51%). POAF occurred more commonly within 3 days of surgery (64.10%) and after major surgery (71.79%). Mortality during admission was 15.38%, and in those who survived admission, 56.06% were commenced on anticoagulation. Hospital readmission occurred in 18.18% and heart failure occurred in 19.70% over an average of 480 days follow up. There was mixed utility of holter monitors in guiding the management of POAF, where management was personalised based on patient factors.

Conclusions: The overall incidence of post operative atrial fibrillation in patients undergoing non-cardiac and non-thoracic surgery is low, however when detected may be associated with a higher burden of clinically significant morbidity and increased risk of inpatient mortality.

A CenTauR scale based on 18F-MK6240

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Background:

A standardized scale for the quantification of tau PET imaging would allow comparison and combination of data across tracers and sites resulting in large meta-analysis and the application of universal cut-offs. The proposed approach called CenTauR (CTR) was evaluated on ^{18}F-MK6240 using both global and regional anchoring.

Methods:

375 ^{18}F-MK6240 PET & T1w MRI scan pairs (HC Aβ- =179; MCI Aβ+ =98; AD Aβ+ =98) from AIBL & ADNeT were spatially normalised using SPM8 and SUVR normalised using the cerebellar cortex. PET scans were then quantified in 4 ROIs [Mesial-Temporal (Me), Meta-Temporal (MT), Temporo-Parietal (TP) and Frontal (FT)] derived from a previously defined "Universal" cortical ROI mask. To anchor the 0 and 100 CTR, we only included HC Aβ- (<10CL) and AD Aβ+ (>25CL) individuals younger than 75y, with MMSE ≥20. We also excluded HC with quantification higher than the 75%tile in the Me ROI and AD patients with quantification lower than the 25%tile in the MT ROI, resulting in 69 HC Aβ- and 29 AD Aβ+. We investigated two CTR scaling approaches using either a single transform based on the TP ROI anchors to transform SUVR into CTR for all composites or using region-based equations scaled with regional anchors.

Results:

The mean and standard deviation (std) for the HC and AD groups are reported in Table 1.

Using a single transformation resulted in the following equation:

$$CTR = 100x(SUVR-0.97)/2.26$$

Region-based equations can be extrapolated from Table 1. Figures 1 and 2 show that regional CTR overstretches quantification in FT compared to single equation-derived CTR. Thresholds set at 2 std above the HC were 2.38, 9.43, 7.66, 1.82, and 6.16 CTR for Me, MT, TP, FT and Universal ROI respectively, and were 7.05, 7.48, 7.66, 10.20, 7.68 CTR when using regional equation-derived CTR.

Conclusion:

The region-based approach provided slightly more consistent CTR distributions in the HC across the ROIs however, this approach tends to over-stretch the CTR values in the frontal region.

Table 1: Demographics, reported as mean (standard deviation)

	HC Aβ-	**AD Aβ+**
Age	70.4 (3.1)	65.0 (6.1)
MMSE	29.0 (1.1)	24.0 (1.9)
Mesial Temporal SUVR	0.88 (0.07)	2.98 (0.66)
Meta Temporal SUVR	1.02 (0.09)	3.23 (0.89)
Temporo-Parietal SUVR	0.97 (0.09)	3.23 (1.03)
Frontal SUVR	0.84 (0.08)	2.49 (1.07)
Universal cortical SUVR	0.94 (0.08)	3.09 (0.95)

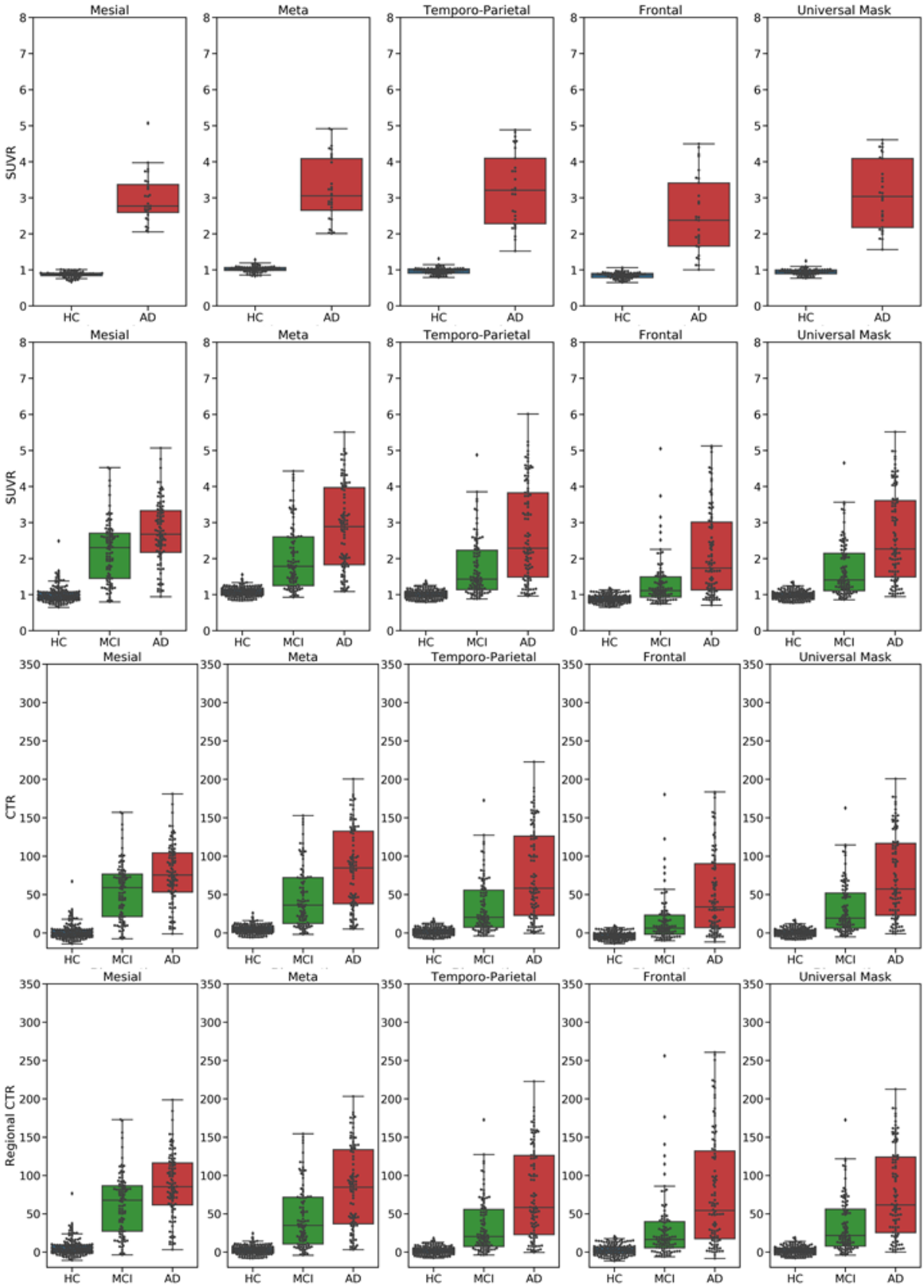

Figure 1: Top row: boxplots of the SUVR values versus clinical diagnosis in anchoring populations. Bottom rows: SUVR, CTR and Regional CTR in the entire cohort.

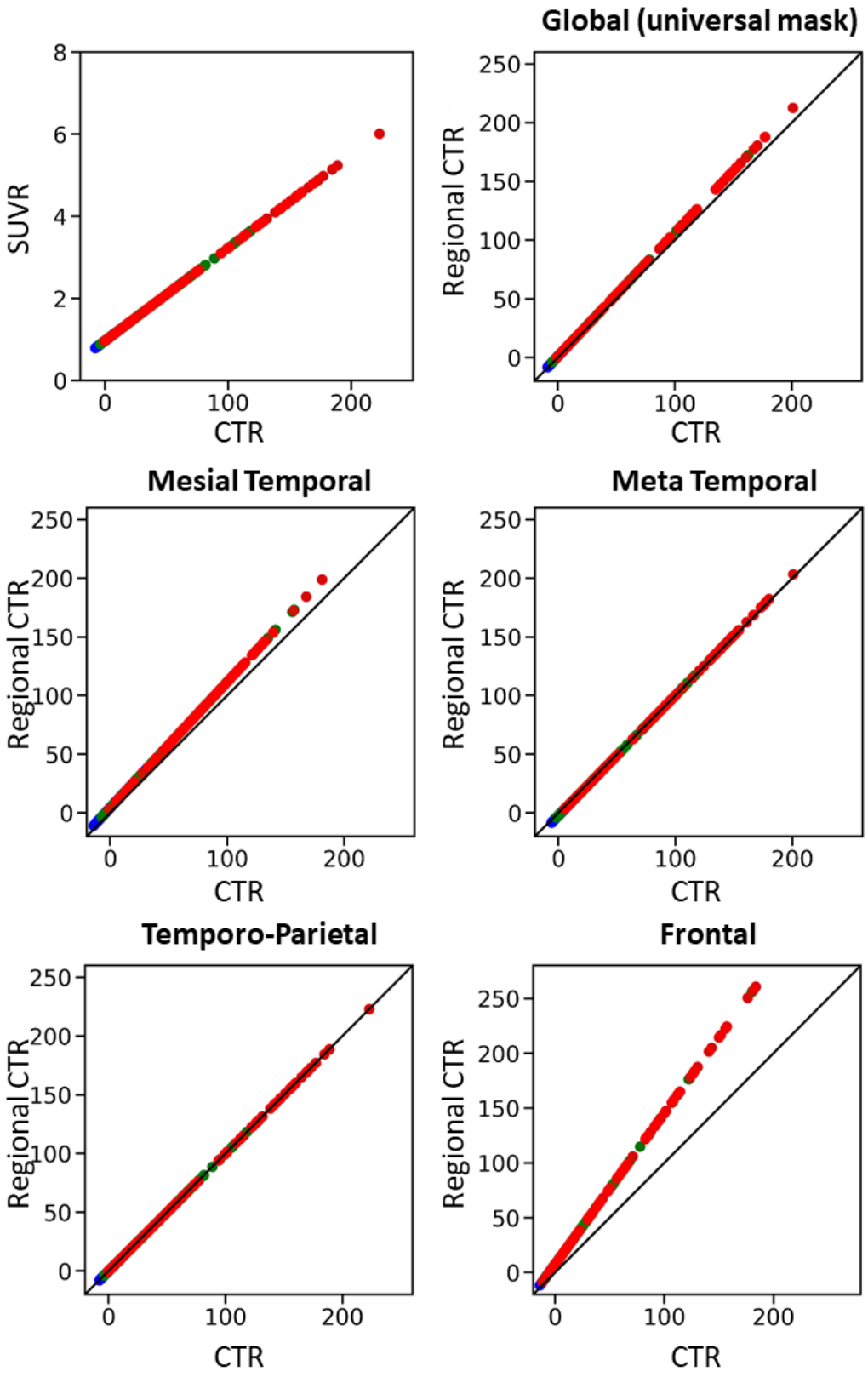

Figure 2: comparison between SUVR and CTR, CTR and regional CTR. (blue HC, green MCI and red AD)

Determinants of sedentary behaviour and time spent in moderate-vigorous physical activity in ILD

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Introduction/Aim:
Physical activity is reduced in people with interstitial lung disease (ILD) however there is less information on sedentary behaviour, an important health risk factor independent of physical activity, and factors that influence time spent in moderate-vigorous physical activity (MVPA). This study aimed to investigate the relationship between sedentary behaviour, time spent in MVPA, exercise capacity and disease severity in people with ILD.

Methods:
Physical activity was measured objectively using a GENEActiv accelerometer over 5–7 days in 70 participants with fibrotic ILD (55 male; mean (SD) age 69±10, FVC%pred 78±19, TLCO%pred 53±18). All participants underwent measurements of lung function (FVC, DLCO) and exercise capacity (6-minute walking distance, 6MWD, cardiopulmonary exercise test and endurance cycle test).

Results:
Average daily sedentary time, and time spent in MVPA were 625 minutes (range 350-946), and 71 (range 2-327) minutes respectively. Sedentary time was negatively correlated with exercise capacity measures (Table 1). MVPA was positively correlated with Nadir SpO_2 and exercise capacity measures (Table 1). Only peak work rate (WRpeak) was an independent predictor of both sedentary time and MPVA. Those who desaturated on exertion spent significantly less time in MPVA (55±71mins) compared to those who did not (93±48mins, p=0.02).

Conclusion
People with ILD spend a substantial amount of time in sedentary behaviour, and those with worse exercise capacity are likely to be more sedentary. Better exercise capacity is associated with greater time spent in MVPA. Physiological markers of disease severity did not predict sedentary time or time spent in MVPA, however exertional desaturation may limit the ability to engage in MVPA.

Table 1: Correlations of MVPA and sedentary time with exercise and respiratory measures

	6MWD	Endurance time	WR Peak	VO_2peak	Nadir SpO_2	TLCO %pred	FVC %pred	Age
Sedentary Time	r= -0.42 p<0.001	r= -0.32 p=0.009	r= -0.33 p=0.006	r=-0.23 p=0.06	r= -0.10 p=0.4	r=-0.24 p=0.3	r=-0.08 p=0.5	r=0.285 p=0.02
MPVA	r= 0.46 p<0.001	r=0.36 p=0.003	r= 0.52 p=0.003	r= 0.42 p<0.001	r= 0.30 p=0.02	0.37 P=0.002	r=0.16 p=0.2	r =-0.387 p=0.001

6MWD, six-minute walk distance; WR peak, peak work rate; VO2 peak, peak oxygen capacity; NadSpO2, lowest oxygen saturation during 6MWD; TLCO, transfer capacity of carbon monoxide; FVC, forced vital capacity

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Dufton, P.H.[1,2], Tarasenko, E.[1], Heywood, K.[1], Mellerick, A.[1]

Enhanced supportive care screening of individuals with advanced cancer receiving long-term systemic anti-cancer therapy: a prospective cohort study.

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Aim: High quality cancer care is more than just the delivery of anti-cancer treatment to people with cancer but includes formal processes to recognise unmet supportive care needs[1]. Current guidelines recommend patients are screened for supportive care needs at diagnosis, and then at regular intervals and as clinically indicated [2,3]. However, repeat supportive care screening is not routinely embedded in clinical care, primarily due to a lack of resources [4]. The aim of this study was to explore the supportive care needs of individuals with advanced cancer receiving long term systemic anti-cancer therapy.

Methods: Between September 2022 – May 2023, the distress thermometer and problem checklist (collectively known as the supportive care screening tool) was administered to patients aged ≥ 18 years, with a diagnosis of metastatic solid tumour malignancy or multiple myeloma and who had received systemic anti- cancer treatment for ≥3 months. The supportive care screening tool was administered at 3-monthly intervals or at change of treatment regimen. Unmet needs identified at repeat screening were further assessed and referrals made as required.

Results: 210 of 349 (60%) eligible patients participated in this study. At baseline, 54% (n=81) of patients screened had a clinically significant distress score (≥4). 31% (n=50) of patients had a clinically significant distress score of ≥4 at 3-monthly intervals, and 43% (n=22) had a clinically significant distress score at change of treatment. The most common problems identified at repeat screening were physical needs (88%, n=184), emotional problems (57%, n=120) and family problems (20%, n=43). 13% (n=27/210) of patients screened had new referrals made at repeat screening, with the most common referral made to social work (n=12).

Conclusion: These findings highlight the significant level of unmet need in patients receiving long term-anti-cancer therapy and the need to develop processes to rescreen patients at regular intervals.

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Dufton, P.H.[1,2], Tarasenko, E.[1], Heywood, K.[1], Mellerick, A.[1]

Frailty in older individuals with advanced cancer receiving long-term systemic anti-cancer therapy: a prospective cohort study

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Aim: Cancer is predominantly a disease of older adults[1]. Multiple geriatric factors have been shown to impact patient outcomes in cancer treatment[2]. Integration of geriatric screening is recommended in the Optimal Care Pathways, which outlines the national standard of high-quality cancer care[3]. However, geriatric screening and assessment is not routinely undertaken due to limited resources and the availability of geriatric medicine specialists[4]. Frailty screening tools address this common barrier[1]. The aim of this study is to screen older individuals receiving long term anti-cancer therapy for frailty.

Methods: Eligible patients included those aged ≥ 70 years, with a diagnosis of metastatic solid tumour malignancy or multiple myeloma and who had received systemic anti- cancer treatment for ≥3 months. Between September 2022 – May 2023 eligible patients were screened with the G8 and Frailty Index Short Form. Screening tools were administered at 3-monthly intervals or at change of treatment regimen. Patients with clinically significant findings were discussed at a weekly multidisciplinary team meeting which was attended by oncology, geriatric medicine, and palliative care.

Results: Of 131 eligible patients, 60 (46%) were screened for frailty at 3-monthly intervals or at change of treatment. 56% (n=27) of patients screened at 3-monthly intervals, and 58% (n=7) of patients screened at change of treatment were identified as having a clinically significant G8 score of 14 or less. At the 3-month and change of treatment timepoint, 68% (n=32/47), and 50% (6/12) of individuals screened using the Clinical Frailty Short Form met the clinically significant cut-off of 0.25, respectively.

Conclusion: In this study we identified a high number of older individuals receiving long term cancer therapy who experienced frailty. These results can be used to inform the delivery of future care to identify frailty in older individuals receiving long term anti-cancer therapy.

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Comparison of a novel Hybrid and Traditional clinical physiotherapy placement model

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Aim: To compare staff and student satisfaction, and student placement marks for two different physiotherapy clinical placement models: a) Novel Hybrid (combination of remote and onsite attendance) and b) Traditional (onsite).

Method: A mixed methods observational study design was utilized. Supervisors (n=11) and students (n=19) involved in one of two placement models were invited to undertake online surveys and semi-structured interviews. Interview data were analysed via reflexive thematic analysis and survey responses were collated. Final Assessment of Physiotherapy Practice (APP) marks for each placement were compared.

Results: . Survey response rates were 100% supervisors and 37% students. Students and supervisors reported similar satisfaction with either model. Both placements achieved similar APP marks (mean (SD) were 64.8(10.4) and 65.4(13.2) for Hybrid and Traditional models respectively)

Supervisors reported some reservations with the Hybrid model, with only one supervisor feeling it achieved comparable clinical development, and most supervisors reporting higher workloads (2-4 hours/week). Interview themes associated with satisfying placements (from 10 interviews) included the value of structure, having explicit learning activities, and ensuring psychologically safety. While all interviewees valued the inclusion of structured timetables, the Hybrid model posed challenges for accessing patients, assessing learning, building rapport, and engaging in a clinical setting. More flexible scheduling and sharing tuition load across the department are potential improvements to both models.

Conclusion: The Novel Hybrid model was acceptable and achieved comparable outcomes to the Traditional model. Use of remote structured learning of clinically applicable activities has potential to innovate and support more sustainable clinical placements.

Implications for student supervision:

- Both clinical placement models were acceptable and achieved similar outcomes.
- Structured placements, explicit learning goals and supportive relationships lead to satisfying placements.
- Remote self-directed learning activities can support clinical placements.

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The demographic characteristics of patients with complex allied health needs admitted to general medicine: preliminary analysis of 3061 patients

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Aim Patients admitted to hospital are increasingly older, frailer, multimorbid and may have complex allied health needs. The AHIP (Allied Health Interdisciplinary Practitioner) service at Austin Health reviews general medicine patients with allied health complexity. The aim was to determine whether demographic characteristics were predictive of complexity for AHIP patients.

Methods Retrospective observational cohort study for patients admitted to general medicine between 1st July 2020 and 30th April 2021. Demographic data was abstracted from the Austin Clinical Research Data Warehouse including age, sex, socioeconomic status, living situation and interpreter requirements. Adverse hospital outcomes including inpatient and 28-day mortality, falls and pressure injury were reviewed. Descriptive statistics were used to summarise patient characteristics and outcomes for AHIP and non-AHIP patients.

Results There were 3061 patients admitted to general medicine in the study period, of whom 328 were reviewed by AHIP (10.7%). The median age of AHIP patients was 84 years (IQR 79- 89), compared with 80 years for non-AHIP patients. AHIP patients were more likely to be over 65 years of age (96.6% vs 80.1%), live alone (19.8% vs 15.6%) be widowed (30.5% vs 25.2%) and require an interpreter (19.8% vs 14.55%) ($p < 0.001$). AHIP patients were less likely to be single (8.8% vs 17.4%). Nil significant differences were observed in sex, socioeconomic or indigenous status or adverse hospital outcomes (inpatient and 28-day mortality, fall, pressure injury). Aside from age, the magnitude of demographic differences was not large, in the context of a majority in both groups being over 65 years.

Conclusion Preliminary analysis of 3061 general medicine patients demonstrates some demographic differences between AHIP and non-AHIP patients, providing information on the profile of patients with complex allied health needs. Based on these findings, demographic data alone is not predictive of having complex allied health needs, and further research is required into which clinical characteristics are predictive of complexity.

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Prevalence of central sleep apnoea in people with tetraplegic spinal cord injury: A retrospective analysis of research and clinical data.

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Aim

Over 80% of people with tetraplegia have sleep disordered breathing, but whether this is predominantly obstructive or central is unclear. This study aimed to estimate the prevalence of central sleep apnoea (CSA) in tetraplegia and the contributions of central, obstructive and hypopnoea respiratory events to sleep disordered breathing summary indices in tetraplegia.

Methods

Research and clinical data from 606 individuals with tetraplegia and full overnight polysomnography were collated. The proportions of different respiratory event types were calculated; overall and for mild, moderate, and severe disease. The prevalence of *Predominant* CSA (central apnoea index ≥5 and more central than obstructive apnoeas) and *Any* CSA (central apnoea index ≥ 5) was estimated. Prevalence of sleep-related hypoventilation was estimated in a clinical sub-cohort.

Results

Respiratory events were primarily hypopnoeas (71%), followed by obstructive (23%), central (4%) and mixed apnoeas (2%). As severity increased, the relative contribution of hypopnoeas and central apnoeas decreased, while that of obstructive apnoeas increased. The prevalence of *Predominant* CSA and *Any* CSA were 4.3% (26/606) and 8.4% (51/606) respectively. Being male, on opiates and having a high tetraplegic spinal cord injury were associated with CSA. Sleep-related hypoventilation was identified in 26% (26/113) of the clinical sub-cohort.

Conclusion

This is the largest study to characterize sleep disordered breathing in tetraplegia. It provides strong evidence that obstructive sleep apnoea is the predominant sleep disordered breathing type; 9-18 times more prevalent than

CSA. The prevalence of CSA was estimated to be 4-8%, significantly lower than previously reported.

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Implementing a sleep apnoea management model in an Australian SCI rehabilitation centre: Results of a feasibility study

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Aim

Obstructive sleep apnoea (OSA) is highly prevalent and poorly managed in SCI. We have previously described the care models of three international SCI rehabilitation centres that independently manage uncomplicated OSA. This project aimed to adapt, implement and evaluate a similar rehabilitation-led model of managing OSA in a rehabilitation centre in Sydney.

Methods

A clinical advisory group oversaw adaptations to the OSA care model, which included clear pathways for ambulatory assessments and treatment. Remote respiratory specialist support was available from the local acute hospital. The model was implemented in July 2022. The mixed-methods evaluation included quantitative analysis of clinical data to assess reach and effectiveness, and qualitative interviews with staff and patients to explore the barriers and enablers to the model.

Results

The multidisciplinary team screened 47 inpatients for eligibility; 26 were assessed for OSA, 15 were diagnosed and recommended treatment, 7 trialled CPAP on the ward, and 3 were discharged with the device. Preliminary analysis of qualitative data suggest that the new care model has improved staff knowledge, skills and confidence in managing sleep and respiratory issues. Staff believe the program is beneficial to patients however barriers included lack of time to assess and treat OSA in a timely manner. In response, additional nursing time was allocated to help coordinate the assessments and treatment.

Conclusion

This is the first time that an Australian SCI rehabilitation centre has implemented an “in-house” OSA management model. Several barriers and

enablers to delivery were identified, which will inform recommendations for sustainability.

Improving anti-PD1 treatment response in breast cancer

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Background
PD1 checkpoint blockade (anti-PD1 therapy) has shown significant success in treating melanoma and lung cancer, yet its efficacy in breast cancer has been more limited. Recruitment of immunosuppressive cells (Tregs) in breast tumours can supress the cytotoxic function of CD8+ T cells and natural killer (NK) cells by upregulating PD-1 expression, a potential cause for the limited efficacy of anti-PD1 therapy. However, blocking of co-stimulatory receptor (ICOS) required for Treg cell activity, could be an effective strategy to revert the suppression of CD8+ T and natural killer (NK) cells in breast tumours.

Aim
To evaluate the efficacy of targeting expression or blocking ICOS receptor to revert immune Treg cell-mediated immunosuppression and improve the efficacy of anti-PD1 therapy in breast cancer.

Methods
In-vivo mammary tumour models were established using female immunocompetent C57BL/6 mice to evaluate the effect of loss of ICOS receptor expression and monoclonal antibody treatments blocking ICOS and PD1 receptors (anti-ICOS and anti-PD1). Harvested tumours were analysed via flow cytometry and multiplex immunohistochemistry to determine the affected immune cell populations and their activity.

Results
Systemic deletion of ICOS in C57BL/6 mice resulted in a significant reduction in mammary tumour growth driven by the increased tumour infiltration of cytotoxic immune cells (CD8+ T, NK) and their activities. Additionally, substantial suppression in Treg cell activation and proliferation was observed in ICOS knockout mammary tumours, indicated by the decreased expression of CD69, PD1, CD25, and Ki67 markers. Moreover, mice treated with anti-ICOS, and anti-PD1 combination treatment demonstrated reduced mammary tumour growth, reduced lung metastasis, and increased overall survival.

Conclusion
Pharmacological blockade of ICOS receptor can supress the Treg cell-induced immunosuppression in breast tumours, sensitizing cancer cells to the anti-PD1 therapy. Hence, anti-ICOS and anti-PD1 combination may provide a promising therapeutic approach for patients with early stage or advanced breast cancer.

Targeting Apoptosis in Uveal Melanoma

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Uveal melanoma is a rare tumour of the eye, with only 125-150 cases being diagnosed in Australia each year. Despite primary treatment, which usually involves surgery, up to 50% of patients will develop metastic disease, typically in the liver, for which there are no standard treatments. Hence, there is an urgent need for new therapies. A new class of drugs called BH3-mimetics has shown significant promise in blood cancers, and is being investigated in a range of solid cancers. These drugs induce apoptosis by directly targeting the BCL-2 family of proteins. In this study, we have tested a panel of BH3-mimetics on uveal melanoma cells. Most drugs on their own are ineffective however, combinations targeting MCL-1 and either BCL-XL or BCL-2 showed significant cell line-dependent synergy. This efficacy correlated with the expression levels of these proteins. Extension of these studies to combinations of different BH3-mimetics with a range of drugs that have previously undergone clinical trials in uveal melanoma patients showed the potential for some of these to progress to pre-clinical studies.

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Transjugular intrahepatic portosystemic shunt insertion as a therapy for portal hypertension improves cirrhosis-associated immune dysfunction.

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Background:
Portal hypertension is associated with an increase in sepsis-related mortality in patients with cirrhosis. We aim to investigate the impact of trans-jugular intrahepatic portosystemic shunt (TIPS) insertion as a therapy for portal hypertension on immune function using a novel immune function assay, Quantiferon Monitor (QFM). Low QFM levels have been validated as an independent predictor of infection risk in cirrhosis.

Methods:
Adult patients with cirrhosis referred for TIPS at a tertiary liver transplant centre were prospectively recruited. Patients were evaluated at baseline, 3- and 6-months post TIPS insertion with QFM, clinical and nutritional data. Body composition was assessed using L3 transverse abdominal CTs to calculate skeletal muscle area (SMA) and subcutaneous fat area (SFA).

Results:
Twelve patients completed the study with a median age of 60 [IQR 56.25, 64.5] and MELD score of 16 [14,19]. Indication for TIPS included refractory ascites (11), hepatic hydrothorax (1) and recurrent variceal bleeding (1). All procedures were technically successful. One patient suffered early TIPS thrombosis treated successfully with thrombectomy and angioplasty. Mean QFM increased from 132.4 ±128.6 at baseline to 270.2 ±251.3 (p=0.0078) at 3 months and 227.0 ± 166.7 6 months post TIPS,(p=0.0034). Increased SMA (139.02cm2 ± 22.82 to 154.46 ± 27.50,p=0.012) and SFA (134.44cm^2 ± 110.96 to 210.24 ± 98.24,p=0.0049) was also observed. There were no significant changes in caloric or protein intake, serum albumin levels or MELD score. There was an overall, but NS, increase in lymphocyte count (p=0.10).

Conclusions
TIPS insertion was associated with a significant increase in QFM level and improved measures of body composition. We postulate that reversal of portal hypertension via TIPS improves cirrhosis associated immune dysfunction by improving nutritional status as demonstrated by muscle and subcutaneous fat gains. Future studies investigating whether increased QFM levels after TIPS translates to reduced infection prevalence in this cohort are warranted.

The impact of branched-chain amino acids on sarcopenia in cirrhosis; a randomised-controlled trial.

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Background and aims
Sarcopenia, defined as reduced muscle function and mass, is associated with adverse outcomes in cirrhosis. Branched chain amino acids (BCAA) target several pathways that lead to muscle loss in this population. We aimed to evaluate the impact of BCAA supplementation on sarcopenia, frailty and performance in patients with advanced liver disease.
Methods
We conducted a 12-month double-blinded, randomised, controlled trial of 30g of daily BCAA supplementation compared to an equicaloric, equi-nitrogenous whey protein. Inclusion criteria included established cirrhosis with evidence of protein malnutrition and reduced handgrip strength. The primary composite endpoint was defined as a 5% increase in handgrip strength (HGS) and / or upper limb lean mass as measured by dual-energy x-ray absorptiometry.
Results
Of the 150 patients who entered the trial (74 BCAA, 76 control) 104 patients (69.3%) were male with a median age of 58 years [IQR 48; 63]. At 12 months, 57% in the BCAA arm and 61% in the control arm had met the primary endpoint (p=0.80). Individually, no between group differences were found in handgrip strength or upper limb lean mass with a mean adjusted difference (MAD) of 1.7kg [-0.2; 3.6] and -0.15kg (-0.37; 0.06] respectively. There were no significant differences in other body composition parameters, physical performance or frailty between the BCAA and control group. There was an overall improvement in fatigue across the entire cohort, but no significant between group differences. Side effects were reported in 15% of patients, with distaste higher in the BCAA arm. There were no differences in rates of hospitalisation, hepatic encephalopathy assessment or mortality.
Conclusion
BCAA supplementation did not improve measures of muscle strength, mass or performance or physical frailty compared to standard whey protein. While subgroups of patients may specifically benefit from BCAA supplementation, there is, as yet, no strong evidence to support their use for sarcopenia therapy alone.

MOSAIC RECURRENT MTOR PATHOGENIC VARIANT IN A PATIENT WITH STABLE SLEEP RELATED FRONTAL LOBE EPILEPSY DESPITE STRIKING PROGRESSION OF DIFFUSE CORTICAL AND SUBCORTICAL T2 HYPER-INTENSITY MRI

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We present a 32 year old patient with sleep-related focal to bilateral tonic-clonic seizures arising from the left frontal lobe commencing at 18 years of age. Initial MRI was considered normal. Despite a stable clinical course and examination, progressive MRI changes were observed over 14 years, involving extensive ill-defined cortical and subcortical T2 hyper-intensity of the entire left cerebral hemisphere with gyral expansion. Serial MRI imaging confirmed enlargement of the lesion over a 12-year period during early adulthood. Histopathological analysis of a left frontal lobe biopsy involving cortex and white matter showed features (e.g., dysmorphic neurons, balloon cells) in white matter most suggestive of focal cortical dysplasia (FCD) type IIb. Genetic analysis of formalin-fixed paraffin-embedded brain tissue revealed a recurrent mosaic pathogenic *MTOR* missense c.4448G>A (p.Cys1483Tyr) gain-of-function variant at 8.5% variant allele fraction. The variant was not detected in peripheral tissue. This variant has been previously reported in patients with hemimegalencephaly (HME). Our findings extend the spectrum of brain lesions associated with *MTOR* variants beyond stable FCDs and HMEs. mTOR hyperactivation leads to neuronal migration defects and development of focal dysplasias which are typically static lesions. In our patient there is evidence of a progressive lesion on imaging, despite a stable clinical picture more consistent with a long-term epilepsy associated tumour (LEAT). These findings may have significant clinical implications for this patient as LEAT may become malignant. The patient therefore requires monitoring with regular imaging long term.

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Early intervention to prevent adverse child emotional and behavioural development following maternal depression in pregnancy: a randomised controlled trial

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Aim

Substantial evidence indicates that antenatal maternal depression is associated not only with maternal wellbeing but also with child emotional and behavioural development. Children of antenatally depressed women are at risk of emotional and behavioural problems, including internalising problems (e.g., anxiety and depression) and externalising problems (e.g., attention problems), that may last at least to adolescence. These enduring effects also constitute an enormous economic cost. Despite the seriousness of this

problem, until recently there existed very few controlled studies evaluating whether active psychological treatment for antenatal depression can prevent adverse child outcomes. We aim to assess whether treating antenatal depression with an evidence-based 8-week structured CBT program can prevent or ameliorate adverse child developmental outcomes at 2 years of age.

Methods
Pregnant women ≤ 30 weeks gestation diagnosed with a depressive disorder are recruited and randomised to CBT or treatment as usual (TAU). The target sample size is 230 and the primary outcome measure is the infant Internalising scale of the Child Behaviour Checklist (CBCL) at 24 months of age. Additional measures include other infant developmental measures and maternal measures.

Results
The trial is ongoing and recruitment is occurring through social media and major maternity hospitals in Victoria. Recruitment was slowed due to the COVID-19 pandemic and the study protocol has been modified to accommodate for the impact of the pandemic. To date, 424 of the 744 women referred to the study have passed the initial screening. Of the 424 women, 106 have been deemed eligible and randomised to one of the study groups (CBT n = 54; TAU n = 52). If results suggest a beneficial effect of antenatal depression treatment on infant outcomes, the project could have repercussions for standard antenatal care, for maternal and infant health services and for preventing the intergenerational transmission of mental health disorders.

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Systematic review: Zone IV extensor tendon early active mobilisation

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Aim
Early active mobilisation (EAM) of tendon repairs is preferred to immobilisation or passive mobilization. Several EAM approaches are available to therapists, however, the most efficacious for use after zone IV finger extensor tendon repairs has not been established. The aim of this study is to determine if an optimal EAM approach can be identified for use after zone IV extensor tendon repairs based on current available evidence.

Methods
Database searching was undertaken on May 25th, 2022, using MEDLINE, Embase and Emcare with further citation searching of published systematic/scoping reviews and searching of the Australian New Zealand Clinical Trials Registry, ClinicalTrials.gov, and the Cochrane Central Register of Controlled Trials. Studies involving adults with repaired finger zone IV extensor tendons, managed with an EAM program, were included. Critical appraisal using the Structured Effectiveness Quality Evaluation Scale was performed.

Results
Eleven studies were included, two were of moderate methodological quality, the remainder were low. Two studies reported results specific to zone IV repairs. Most studies utilized relative motion extension (RME) programs; two utilized a Norwich program, and two other programs were described. High proportions of good and excellent range of motion (ROM) outcomes were reported. There were no tendon ruptures in the RME or Norwich programs; small numbers of ruptures were reported in other programs.

Conclusion
The included studies reported minimal data on outcomes specific to zone IV extensor tendon repairs. Most studies reported on the outcomes for RME programs which appeared to provide good ROM outcomes with low levels of complications. The evidence obtained in this review was insufficient to determine the optimal EAM program after zone IV extensor tendon repair. It is recommended that future research focus specifically on outcomes of zone IV extensor tendon repairs.

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Exertional Desaturation During the 6-Minute Walking Test Versus Daily Life in People with Fibrotic Interstitial Lung Disease

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Backgroung
People with fibrotic interstitial lung disease (fILD) typically experience a decline in lung function, marked functional disability, early mortality and can present low oxyhaemoglobin levels (SpO_2) on exertion. Exertional desaturation is an important marker of disease severity in people with fILD. The 6-minute walking test (6MWT) is used to identify exertional desaturation and justify the prescription of ambulatory oxygen therapy (AOT). It is unclear if it reflects desaturation in daily life in patients with fILD.

Aim
To compare exertional desaturation during 6MWT and during daily life in patients with fILD.

Methods
Participants performed two 6MWT and underwent home oximetry during waking hours for 2 consecutive days. The relationship between 6MWT exertional desaturation and daily desaturation was evaluated. The impact of physical activity (steps per day) on desaturation during daily life was also assessed. Parametric tests, Pearson's correlation coefficients and multiple linear regression analysis were used.

Results
Eighty-two people with fILD were recruited and 58 recordings were analyzed. Participants had moderately severe lung disease and low physical activity. The 6MWT nadir SpO_2(%) was higher than daily minimum SpO_2 (82±4% vs 75±5%; P< .001). Lower daily SpO_2 correlated with shorter 6MWT distance [P= .036], lower 6MWT nadir SpO_2 [P= .019] and fewer steps per day [P= .025]. The number of steps per day (β=0.001; P= .045) and 6MWT nadir SpO_2 (β=0.31; P= .027) predicted the variability in the daily minimum SpO_2.

Conclusion
The 6MWT can accurately identify exertional desaturation in people with fILD but it is not the most suitable tool for AOT prescription. The variability of daily SpO_2 may be predicted by 6MWT nadir SpO2 and physical activity, parameters that should be considered for AOT prescription.

Foxp3+ regulatory T cells (Tregs) are an immunosuppressive subset of CD4+ T cells that play vital roles in curbing autoimmunity and maintaining tissue homeostasis. However, their elevated presence in the tumour microenvironment dampens anti-tumour immunity and is correlated with poor prognosis. Targeting Tregs, however, poses the risk of inducing autoimmune side effects. To circumvent this, we aim to identify molecules to target Tregs specifically within tumours to boost anti-tumour immunity without triggering autoimmunity. To identify tumour- and tissue-specific features of Tregs, we performed single cell RNA-seq of CD4+ T cells isolated from multiple primary and metastatic murine tumours, controlling for both tissue and tumour types. To understand the developmental origin of tumour Tregs, we also mapped the TCR repertoire of CD4+ T cells to their transcriptomic profiles. Additionally, we captured the transcriptome and TCR repertoire of splenic CD4+ T cells to elucidate pan-tumour Treg features and their lymphoid origin. Transcriptomes of CD4+ T cells in various tumours revealed heterogeneity within both conventional CD4+ T cell (Tconv) and Treg subsets, which are conserved across tumours but at varying abundance. Comparisons between Treg transcriptomes from the same tumour at different tissue locations revealed dominant tissue-imprinted features. RNA velocity analysis on tumour Tregs identified a conserved precursor population marked by unique transcriptional signature that included a novel survival factor. Tumour type-specific and pan-tumour features of Tregs offer promising prospect on tumour-specific depletion of Tregs to revert the immunosuppressive tumour microenvironment.

Beclin1 is a novel regulator of gastrointestinal health

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Background: The gastrointestinal (GI) tract is comprised of a single epithelia layer that acts as a barrier to protect against pathogens whilst absorbing nutrients. Due to its continual exposure to damaging signals, maintenance of intestinal homeostasis is critical to sustaining a healthy gut. Genome-wide association studies have revealed the importance of autophagy regulators in GI homeostasis, with mutations in such genes implicated in Inflammatory Bowel Disease (IBD).

Despite the robust nexus established between autophagy and IBD, the well-established autophagy regulator, BECLIN1, has not yet been implicated in IBD. We discovered that adult mice lacking BECLIN1 succumb to severe intestinal disruption resembling IBD, and these animals die within a week of gene deletion. In contrast, deletion of the *bona fide* autophagy regulator, ATG7, did not result in the same fatal intestinal disruption, even after one month. These studies suggest that BECLIN1 plays a critical role, beyond autophagy, in the regulation of GI homeostasis. We hypothesise this is due to the less well-understood role of BECLIN1 in endocytic trafficking where unlike BECLIN1, ATG7 has no known function.

Methods/Results: Here, we investigated the role of BECLIN1-mediated endocytic trafficking in GI homeostasis using intestinal epithelium-derived organoids generated from both BECLIN1 and ATG7 knock-out mice. Using immunofluorescence imaging of whole-mount organoids, we observed that BECLIN1, but not ATG7, loss resulted in the abnormal distribution of various endocytic trafficking compartments. We also saw the concomitant mislocalisation of E-cadherin, normally trafficked via the endocytic pathway. E-cadherin is a major component of the adherens junction mediating cell-cell interactions. As such, this aberrant membrane localisation of E-cadherin likely contributes to the compromised intestinal architecture and increased intestinal permeability seen following BECLIN1 loss.

Conclusion: We have therefore discovered a previously unappreciated role for endocytic trafficking, mediated by Beclin1, in the regulation of GI homeostasis. Further studies using intestinal organoids are now underway to uncover other signalling pathways and cargo disrupted by deregulated BECLIN1-mediated endocytic trafficking that lead to loss of normal gut function.

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Tau positron emission tomography: utility as a biomarker for chronic traumatic encephalopathy

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Aim
Chronic traumatic encephalopathy (CTE) is a neurodegenerative disease characterized by brain tau deposition, associated with exposure to repetitive head impacts (RHI). It requires a post-mortem diagnosis. We previously reported a frontotemporal predominant ^{18}F-MK6240 PET pattern in a retired Australian Rules Football player, in the context of a moderate amyloid-beta plaque burden.[1] This study aimed to investigate the utility of tau ^{18}F-MK6240 PET as a biomarker for CTE in contact sports players with exposure to repetitive head impacts (sRHI).

Methods
sRHI (n=33) and age-matched healthy controls (HC) (n=32) completed amyloid (^{18}F-NAV4694) and tau (^{18}F-MK6240) PET scans. Amyloid PET was quantified in Centiloids. Tau standardized uptake value ratios (SUVRs) were generated for four regions of interest.

Results
For sRHI, the primary contact sport was Australian Rules Football (n=17), boxing/kickboxing/martial arts (n=11), rugby (n=4) and soccer (n=1), with 36.4% participating at a professional level. sRHI had a mean age of 54.2 (±9.2) (vs HC 53.0±9.5, p=0.61), and 94% were male (vs HC 78%, p=0.08). sRHI did not differ from HC in years of education (p=0.46) but had more impaired MMSE (28.1±1.9 vs 29.3±0.8, p=0.006, d=-0.80) and Clinical Dementia Rating scores (0.21±0.3 vs 0±0, p<0.001, d=1.25). sRHI and HC did not differ in mean Centiloid values (2.9±8.4 vs 3.0±8.2). sRHI and HC did not differ in ^{18}F-MK6240 SUVR in the regions examined, and no differences were observed between professional and amateur sRHI.

Conclusion
Contact sports players with exposure to repetitive head impacts did not differ from healthy controls on ^{18}F-MK6240 SUVR in frontal, mesial temporal, and temporoparietal brain regions. Study limitations include the small sample size, heterogeneity in sports type and highest level of participation, and participants

with relatively mild cognitive and functional impairments. Additionally, while ^{18}F-MK6240 has high affinity for 3R/4R tau in Alzheimer's disease, its affinity in CTE, particularly important at early stages, remains unclear.

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Developing targeted staff education and training by understanding disability awareness at Austin Health

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4. *Summer Foundation Limited*

Aim

Austin Health is a provider of several state-wide specialist programs for people with disability and complex care needs. However, even in general medical wards, the prevalence of patients with disability (PWD) has been as high as 22%. Low disability awareness, negative attitudes, and lack of reasonable adjustments to communication and the clinical environment are contributing factors to poorer health outcomes for PWD[1]. The Disability Liaison Officer (DLO) program works to reduce barriers to accessing healthcare. To inform the development of targeted education, DLO are aiming to explore the extent of knowledge and awareness held by staff regarding PWD receiving healthcare at Austin Health.

Methods

An online survey was disseminated to a convenience sample across the staff population, including acute, subacute and outpatient work areas.

Results

One hundred and seventeen staff have completed the survey to date, with majority of respondents from allied health. Seventy-one percent of respondents agreed that it is within their normal role to engage with PWD. Varying confidence levels were recorded for providing care to and engaging in conversations with people about their disability. When asked about familiarity with key initiatives and resources, 66% hadn't heard of the Austin Health Autism Care Plan, while 40% were not familiar with the local Disability Action Plan. All respondents indicated they would like to know more about disability related initiatives/resources. Data collection is ongoing and results from a larger sample will be presented.

Conclusion

Results of this study will inform the development and roll out of targeted disability awareness education, that ultimately seeks to improve the end-user healthcare experience by enhancing access to and quality of care delivered to people with disability. Findings may offer relevance to other organisations.

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Unlocking Insights from Repetition: Exploring Predictors and Rates of Re-presentation in the Rapid Access Chest Pain Clinic Model

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Aim
Rapid Access Chest Pain Clinic (RACPC) is a model of care designed to provide early specialist follow-up for patients with low-to-intermediate risk chest pain. We sought to determine the predictors and rate of re-presentation after RACPC review.

Methods
We conducted a retrospective chart review on all patients seen at Austin Health's RACPC between 2012 and 2022. Demographic factors, cardiac risk factors (CRF) and investigation choices were compared between repeat presenters, defined as patients with two or more visits to RACPC, and patients with only one visit.

Results
A total of 4109 episodes of care were registered between 2012 and 2022, of which 125 (3.1%) were repeat presentations. Overall cohort median age was 56 years (Interquartile range 48-64) with a slight male predilection (51.3%).

Repeat presenters were 1.69 times more likely to have had a CT coronary angiogram (CTCA) on their initial visit compared to once-off presenters ($p<0.01$). On re-presentation, most underwent functional testing with transthoracic stress echocardiogram (TSE 51.7%) or myocardial perfusion scan (MPS 9.7%). Invasive angiogram was more commonly requested on repeat presenters compared to single presenters (11.7% vs 8.3%) with a 40% revascularisation rate.

There was no significant difference in age ($p=0.28$), gender ($p=0.47$) or BMI ($p=0.55$) between repeat and single presenters. However, repeat presenters were more likely to be smokers (OR=6.77 $p=0.03$) and have higher hsCRP ($p<0.01$).

Conclusion
RACPC is a safe and efficient model of care with a low rate of re-presentation. Prospective studies with follow-up may shed further insight into the long-term performance of RACPC.

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Developing a method to measure the release of cytotoxic drugs conjugated to antibodies

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Aim

Antibody drug conjugates (ADCs) are a highly promising class of novel therapeutics that combine the exquisite targeting ability of antibodies with the toxicity of cytotoxic agents. Being able to measure the release of the cytotoxic drug as a function of the time and the amount of antibody given will provide valuable insights into the effectiveness of ADC treatment. The aim of this project is to evaluate the feasibility of measuring the release of a drug from an antibody drug conjugate over time using LCMS/MS.

Methods

A Shimadzu 8040 LCMS/MS system was used for the establishing of fragmentation patterns. Pure samples of the drug-linker molecules were injected into the LCMS for establishment of parent ion masses and optimization of fragmentation patterns. MMAE and Dxd payloads with different linkers were attached to antibodies via malemide chemistry. Reactions of the free malemide with cysteine and glutathione were undertaken as model reactions for simulating payload de-conjugation.

Results

Multiple ion adducts were observed for both linkers, with M+H, M+Na and M+K ions all being observed. Different collision energies were required for the fragmentation of each of these species and had to be optimized. Reaction mixtures containing cysteine and glutathione both showed alkylation of the malemide functional group by the free thiol. This was observed by the formation of a product ion with mass increases of 121 and 307 respectively. The products still yielded the parent drug ion as a fragment, indicating that the drug molecular weight can be used as a diagnostic fingerprint for these adducts.

Conclusion

Fragmentation patterns of MMAE and Dxd linkers were established on the Shimadzu 8040 LCMS/MS system. Initial experiments indicate that deconjugation of malemide linkers using glutathione is possible and these adducts can be identified through a combination of chromatography retention time and molecular ion fragmentation.

References

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Radiological assessment of body composition in cirrhosis; a comparison of Dual-Energy Xray Absorptiometry (DEXA) and CT imaging.

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Background: Sarcopenia and sarcopenic obesity carry important prognostic implications in cirrhosis. While there is controversy surrounding the inclusion of muscle strength in the definition of sarcopenia, muscle mass measurement is universally recommended. There is a clinical need for accurate, accessible, and reproducible radiological measures of muscle and fat mass in this population. Tissue segmentation of CT imaging is considered gold-standard for the measurement of muscle mass in clinical research. However, its uptake in clinical practice is limited due to high radiation exposure, cost of dedicated software and time and expertise required for tissue segmentation. Dual-energy x-ray absorptiometry (DEXA) provides a low-radiation and reproducible assessment of body composition with readily available results without the need for further analysis. Regular DEXA scans are also recommended as standard of care for osteoporosis monitoring in patients with cirrhosis. Despite this, few studies have utilised DEXA to measure muscle and adipose tissue parameters in cirrhotic cohorts. We aim to assess the correlation between CT and DEXA assessments of body composition in cirrhosis.

Methods: One-hundred and fifty patients with cirrhosis enrolled in a clinical trial (ACTRN12618000802202) underwent a single slice transverse CT at the third lumbar vertebrae (L3) and DEXA body composition analysis for assessment of muscle and fat mass at a single time point. Tissue segmentation was performed on L3 CTs using Tomovision® software (Version 5.0, Toronto, Canada).

Results: One hundred and four patients (69%) were male with a median age of 57 years [IQR 48, 63] and MELD score of 14 [6, 17]. Forty-three (28%) of patients had clinically detectable ascites, 24 of these requiring regular large volume paracentesis. Appendicular lean mass (g) and upper limb lean mass (g) measured by DEXA showed excellent correlation with skeletal muscle area (SMA, cm^2) measured on CT (r=0.82, p<0.001 for both) (Figure 1). Total lean mass demonstrated moderate correlation with SMA in patients without ascites (r=0.66, p<0.001), but poor correlation in patients with clinically detectable ascites (r=-0.011, p=0.94). There was a strong positive correlation between subcutaneous adipose tissue on CT and fat mass on DEXA (r = 0.92, p<0.001) and visceral adipose tissue (cm2) as measured by L3 CT and DEXA (r = 0.81, p<0.001).

Conclusion: DEXA provides a safe and reproducible assessment of body composition that correlates well with CT measures of muscle and adipose tissue parameters in patients with cirrhosis. The presence of ascites confounds the measurement of total lean mass, but appendicular lean mass and upper limb lean mass provide suitable alternatives that correlate strongly with SMA. Body composition assessment may be incorporated into routine DEXAs performed in cirrhotic cohorts undergoing osteoporosis surveillance.

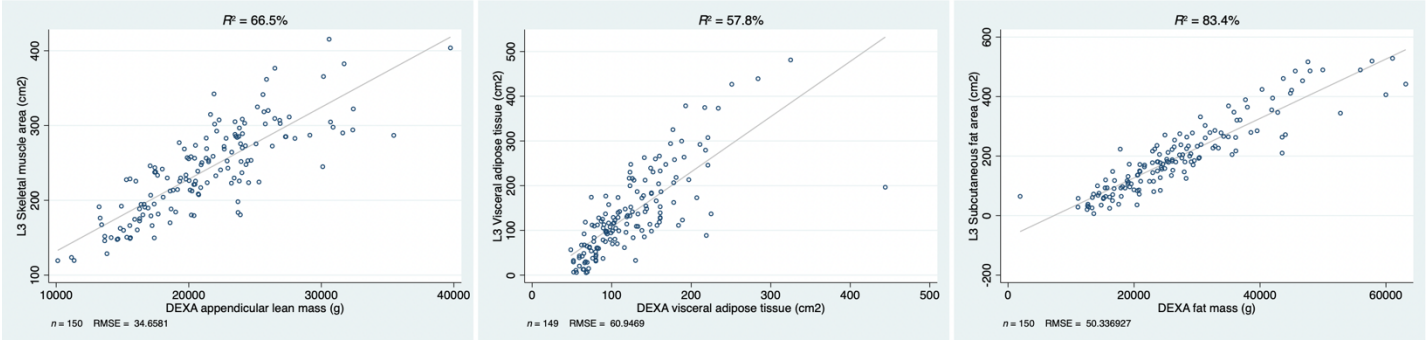

Figure 1: Comparison of CT and DEXA assessment of body composition in cirrhosis.
DEXA; dual-energy x-ray absorptiometry, L3; third lumbar vertebrae.

BACKGROUND:
Preeclampsia is a severe and life-threatening obstetric disease with a complex aetiology and pathogenesis. Evidence suggests complement system overactivation may play a role in the pathology and disease progression, however the specific dysregulated components are unknown. This study aimed to characterise complement effector levels (C3, C4 and C5) in human placenta, identifying whether they might be potential targets for preeclampsia treatment.

METHODS:
Primary human placental tissue was collected from first trimester (7-11 weeks; n=11), preterm (24-34 weeks; n=15) and term (37-39 weeks; n=10) gestation. Pathological placental samples were collected at <34 weeks' (preterm) from pregnancies complicated by preeclampsia (n=25), both preeclampsia and Fetal Growth Restriction (FGR) (n=20), and FGR (n=13) without preeclampsia. Pathological samples were also collected at >37 weeks' gestation (term) from pregnancies complicated by preeclampsia (n=10) and FGR (n=18). Quantitative RT-PCR was used to assess gene expression.

RESULTS:
The C3 and C4 genes were overall not differentially expressed across gestation. However, the C5 gene was found to be differentially expressed throughout gestation, with increased expression in preterm compared to first trimester and term tissue. C3, C4 and C5 expression was decreased in preterm preeclamptic samples compared to control, but this was only statistically significant for C5 ($p<0.05$). Neither C3 nor C4 expression was altered in term preeclampsia compared to control, however C5 expression was significantly increased ($p<0.0001$) in term preeclamptic samples compared to control. Interestingly, there was no increase in C5 gene expression in term FGR compared to term preeclampsia.

CONCLUSION:
This study demonstrates that key complement effectors are expressed by the human placenta throughout gestation and are dysregulated in preeclampsia. Further studies are underway to investigate the effects of inhibiting these complement effectors, with an aim to ameliorate disease.

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Prehabilitation improves nutritional and muscle parameters prior to oesophago-gastric cancer surgery

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Aims
Malnutrition is highly prevalent in patients with oesophago-gastric cancer and contributes to adverse peri and post operative outcomes. Prehabilitation including early, tailored nutrition interventions may improve clinical outcomes. We aim to describe changes in nutritional and muscle parameters in patients undergoing a multidisciplinary prehabilitation program prior to oesophago-gastric surgery.

Methods
Patients were provided with a comprehensive program encompassing nutrition, physical and psychological optimization and followed prospectively until surgery. Nutrition and muscle parameters were assessed via Patient Generated Subjective Global Assessment (PG-SGA), handgrip strength (HGS), triceps skinfold (TSF) and calf circumference (CC). Targeted nutrition interventions aimed to meet patient's measured resting metabolic rate as measured by indirect calorimetry.

Results
Ten patients have completed prehabilitation (90% male, mean age 63.8 ±6.7 years). Nutritional status improved significantly from 40% malnourished at baseline to 10% malnourished at surgery (p=0.03), with a non-significant trend (p=0.08) towards improved nutrition impact scoring on PG-SGA during the period of prehabilitation (mean 8.2±5.7 at baseline versus 3.3±2.5 at surgery), with a large effect found (d=1.1 95% CI [1.67-3.52]). Dietary energy and protein intake improved significantly following dietetic intervention, from 6.5± 2.2 MJ and 63.1± 24 g protein to 9.2±1.4 and 93.1±19 g protein (both p<0.005); equivalent to 94% of individual's measured metabolic rate and 100% of estimated protein requirements. Anthropometric improvements were seen in TSF (9.9±6.1 to 11.4±6.4 mm p=0.04) and CC (36.2±2.5 to 38.0±3.1 cm p=0.001). Non-significant improvements in HGS were seen (31.5±6.12 to 34.3±8.6 p=0.27) with a small to medium effect size found (d=0.37 95% CI [3.8 -5.6]).

Conclusions
Preliminary data shows that prehabilitation improves dietary intake, nutritional status and anthropometric parameters in patients undergoing oesophago-gastric cancer surgery. Future research will focus on replicating these results in a larger sample and observing the impact on post operative patient and clinical outcomes.

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Exploring the regulation of placental insufficiency biomarker SPINT1 and its function in placentation

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Aim

Low circulating levels of Serine Peptidase Inhibitor Type 1 (SPINT1) are associated with fetal growth restriction (FGR)[1] and it is critical to murine placentation[2,3]. But what leads to this aberrant expression in human placental dysfunction is not yet known, nor is its function in the physiological development of the placenta.

Methods

Immunohistochemistry for SPINT1 was performed on placental sections from across gestation and human Trophoblast Stem Cells (hTSC)[4] model first trimester placenta. SPINT1 was measured in these cells and those of their differentiated lineages, syncytiotrophoblast (SCT) and extra-villous trophoblast (EVT).

To determine what regulates SPINT1 expression, cells cultured in 8% O_2 were subject to different treatment conditions to observe the effect on *Spint1* mRNA and SPINT1 protein expression and secretion, including: (1) hypoxia (1% O_2); (2) siRNA knockdown of potential transcription factors CDX2, GRHL2, HIF-2α; (3) inhibiting MMP-mediated secretion using broad spectrum MMP-inhibitor Batimastat.

SPINT1's function was investigated by silencing SPINT1 in hTSCs using siRNA and observing the effect on critical cellular functions: (a) proliferation, using xCELLigence; (b) differentiation in SCT and EVTs; and (c) inhibition of downstream proteolytic activity (fluorogenic peptide substrate).

Results

SPINT1 is expressed by placental cytotrophoblast layer, although not exclusively.

Regulators of SPINT1 were found to be: (1) hypoxia, which reduced *Spint1* mRNA transcripts by 40% ($p<0.01$) and protein secretion by 50% ($p<0.01$) relative to 8% O_2; (2) silencing transcription factors did not alter *Spint1* mRNA, however cellular and secreted SPINT1 was reduced with siGRHL2 ($p<0.01$), suggesting post-transcriptional modifications; and (3) MMP-mediated release from cell surface, as SPINT1 secretion was reduced by 28% when hTSCs were treated with 10uM Batimastat ($p<0.05$).

When SPINT1 was silenced, it led to (a) reduced proliferation and (b) altered differentiation of cytotrophoblasts, however, (c) no significant change to downstream proteolytic activity, potentially due to compensatory upregulation of SPINT2.

Conclusion

This has elucidated some cellular mechanisms underlying decreased levels of SPINT1 observed in FGR, better understanding its role in placental pathophysiology.

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Dose, Content, and Context of Usual Care in Stroke Upper Limb Motor Interventions: A Systematic Review

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Aim
The aims of this systematic review were to describe the current dose and content of usual care upper limb motor intervention for inpatients following stroke and examine if context factors alter dose and content.

Methods:
A systematic search (EMBASE, MEDLINE) was completed from January 2015 to February 2023 (PROSPERO CRD42021281986). Studies were eligible if they reported non-protocolised usual care upper limb motor intervention dose data for stroke inpatients. Studies were rated using the Johanna Briggs Institute critical appraisal tool. Data were descriptively reported for dose dimensions of time (on task or, in therapy) and intensity (repetitions, repetition/minute), content (intervention type/mode), and context (e.g., severity strata).

Results:
Eight studies were included from four countries, largely reflecting inpatient rehabilitation. Time in therapy ranged from 23 to 121 min/day. Time on task ranged from 8 to 44 min/day. Repetitions ranged from 36 to 57/session, and 15 to 282/day. Time on task was lowest in the stratum of people with severe upper limb impairment (8 min/day), the upper limit for this stratum was 41.5 min/day. There was minimal reporting of usual care content across all studies.

Conclusion:
Upper limb motor intervention dose appears to be increasing in usual care compared to prior reports (e.g., average 21 min/day and 23 to 32 repetitions/session). Context variability suggests that doses are lowest in the stratum of patients with a severely impaired upper limb. Consistent reporting of the multiple dimensions of dose and content is necessary to better understand usual care offered during inpatient rehabilitation.

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Sub-acute opioid reductions in Transition Clinic: 2021 vs 2023

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Background and Aim
Transitional pain clinics can reduce the risks of persistent pain, disability, and prolonged opioid use after surgery [1,2]. To minimise these risks, the Austin Transition Clinic treats patients with complex pain of any cause, during the sub-acute period after hospital discharge. Pain Nurse Consultants review patients' pain experience, function, and analgesia use, provide patient education and written advice to GPs with guidance of a Specialist Anaesthetist. We compared opioid reductions from baseline to clinic discharge, between 2021 and 2023.

Methods
We block sampled 60 patients seen in Transition clinic in 2021. In 2023, we collected clinic data contemporaneously, and all 126 patients seen in the first 7 months were included. We compared patient characteristics between the years using chi-squared and Wilcoxon rank-sum tests; and within-group changes in opioid dose using Signed-rank tests, in Stata 15.

Results
There were no significant differences in baseline characteristics between years. Patients had a median age of 54 [IQR 40-65]. They were predominantly female (63%), opioid tolerant (75%), and admitted for orthopaedic surgical care (62%). Median oral morphine-equivalent daily doses (oMEDD) were 30mg in 2021, and 42mg in 2023 (p=0.4).

At hospital discharge, median oMEDD was 60mg in 2021, and 90mg in 2023 (p<0.001). At clinic discharge, oMEDD was significantly reduced from baseline in both years (median 30mg in 2021, p=0.05; 26mg in 2023, p=0.001). By clinic discharge in 2023, Functional Activity Scores showed 61% of patients had no functional limitation, 36% were partially limited, and 3% remained severely limited by pain.

Conclusion
Pain Nurses in Transition Clinic continue to effectively support patients with complex pain, promote functional recovery, and reduce opioid doses in the sub-acute period. Baseline and inpatient opioid use were unexpectedly slightly higher in 2023. Future work aims to introduce patient-reported pain interference measures and examine outcomes at 6 months.

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Targeting the cancer associated fibroblasts in breast cancer

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Aim
To investigate if breast fibroblasts co-cultured *in vivo* with varying subtypes of breast cancer cells (luminal (ERα+), HER2 positive, or triple negative breast cancer (TNBC)) behave differently.

Methods
NOD SCID gamma mice (n=5) were co-injected with ERα+ cells (MCF-7: 833,333 cells) or TNBC cells (SUM159scidneoLUC_Lu2 (SUM159Lu2), 500,000 cells; MDA-MB-231: 833,333 cells) and puromycin-resistant fibroblasts (tumour naïve 522 or tumour educated 544) at a 1:3 cancer cell-to-fibroblast ratio. Control mice were injected with cancer cells alone or fibroblasts only. Tumour volumes were measured according to the formula: $(L*W^2)/2$, where L is length and W is width. To isolate fibroblasts, tumours were resected at experimental endpoint, dissociated using 0.25% trypsin-0.05% EDTA and grown in puromycin-containing media (2μg/mL). Where required, FACS sorting was used to obtain pure fibroblast populations. Re-isolated fibroblasts were subjected to western blot analysis to test for CAF marker (αSMA, FAP) expression levels.

Results
No significant changes in tumour growth were observed when 522 or 544 fibroblast lines were co-injected with MCF-7 or MDA-MB-231. In contrast, mice injected with SUM159Lu2 and 522, showed a significant increase ($P<0.01$) in tumour growth (day 13 (mean ± SD), 970.89 ± 91.78mm^3), while the addition of 544 generated a significant reduction ($P<0.01$) in tumour growth (day 13, 286.92 ± 90.80mm^3) compared to SUM159Lu2 injected alone (day 13, 662.71 ± 160.45mm^3). Subsequent western blot analysis demonstrated an increase in αSMA expression in re-isolated 522 cells from SUM159Lu2 tumours compared to pre-injected 522 cells. A reduction in both αSMA and FAP expression was observed in re-isolated 544 cells compared to pre-injected 544 cells.

Conclusion
We show that varied interactions take place between different subtypes of breast cancer cells and different types of fibroblasts. Understanding how fibroblasts stimulate or inhibit tumour growth might lead to new therapeutic approaches to treat cancer.

Perspectives of Culturally and Linguistically Diverse (CALD) community members regarding mental health services: A qualitative analysis

Abstract

Victoria is one of the most multicultural states in Australia. Many CALD communities in Victoria may have encountered complicated migration journeys and complex life stressors during their initial settlement, leading to adverse mental health concerns. This diversity necessitates public policy settings to ensure equity and access in health services planning and delivery. While the MH policies and services take cultural diversity into account, there needs to be more implementation of those components of MH policies that relate to the particular needs of various CALD communities in Victoria. Even though mental health services prevent and address mental health issues, many barriers can impair CALD community access and utilisation of mental health services. Furthermore, the recent Royal Commission inquiry into the Victorian Mental Health system drives a renewed policy imperative to ensure meaningful engagement and cultural safety of all people accessing and utilising mental health services (Department of Health, 2023).This study focused on the perspectives of people from CALD communities in Victoria regarding their mental health service needs, understandings of and experiences with mental health services to prepare an education package for mental health nurses as part of a larger multi-method research project. A qualitative descriptive design was used to collect and analyse the perspectives of 21 participants in Victoria, using telephone interviews, followed by thematic analysis. The themes and sub-themes identified were: Settling issues; Perceptions of understanding of mental health issues *(help-seeking attitudes toward mental health issues; the need for CALD community education*); Perceived barriers to accessing and utilising mental health services in Victoria (*socio-cultural and language barriers; stigma, labelling and discrimination; knowledge and experience of accessing health facilities*); and Experience with mental health services and professionals. Community participation, mental health professional education, and robust research regarding the mental health needs of CALD people are some of the recommended strategies to improve access and utilisation of mental health services in Victoria.

Skin Cancer Profile in Liver Transplant Patients: An Australian cohort

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Background: The development of aggressive and rapidly growing cutaneous malignancies is a well-established secondary consequence of liver transplantation. Immunosuppression required post-transplant is a known risk factor for carcinogenesis however there remains a question on the impact of other contributing patient factors. Limited literature exists on the characteristics of cutaneous malignancies post liver transplant and by extension there lacks an ideal surveillance protocol and management guideline for skin cancers in this population.

Objective: To undertake a large scale, retrospective case control study that analyses skin cancer data in Liver transplant recipients at a single major transplant centre in Victoria, Australia with the aim to create a decision tree to stratify the risk of developing skin cancers post liver transplant.

Methods: A total of 216 liver transplant recipients were identified from the Austin Health Liver transplant database from 2000 to 2020. 116 patients were found to have developed cutaneous malignancies post-transplant with the remaining patients utilised as a control group for comparison. Demographic data including Fitzpatrick skin type and skin cancer risk factors were collected. 443 individual cutaneous malignancies were identified, and further analysis of subtype, location and malignant characteristics were performed.

Results: Age, male sex, Fitzpatrick skin type 1-2, smoking, family and personal history of skin cancer pre transplant, increased frequency of blistering sunburn and Azathioprine use was associated with the development of skin cancer. Most skin cancers developed were SCCs in the head and neck area. These cancers were disproportionately moderately and poorly differentiated however with early detection the majority of these lesions were managed by general practitioners and dermatologists in the community.

Conclusion: The data demonstrates that a variety of personal risk factors increase the risk of developing cutaneous malignancies post liver transplant. Furthermore, it confirms that skin cancers developed are higher grade and more aggressive than in the normal population. This helps to stratify patient risk profiles to identify a high-risk liver transplant recipient cohort who are likely to develop skin cancers and helps to determine future protocol development for skin cancer surveillance in the post liver transplant population

Obesity and Alzheimer’s disease – a Meta-analysis

Background

Obesity is also a leading global cause of death and disability, and it is a risk factor for dementia that may be modifiable. Although several studies suggest that mid-life obesity in linked with increased risk for late-life dementia, the relationship between later life body composition and dementia risk is
less clear.

Method

Meta-analysis from two observational studies, AIBL and ADNI. BMI was categorized according to WHO criteria. Multivariable linear regression determined association between BMI category and outcomes: brain beta-amloid (PET Centiloid Value), MRI (global, hippocampal and white matter hyperintensity volume), and cognition (PACC [preclinical Alzheimer cognitive composite], composite scores for attention, executive and episodic memory).

Results

4,668 individuals were included (49.1% male/59.9% female, mean age 72.4 years, 41.7% APOE4 Carriers, 51.2% normal cognition [NC], 32.9% Mild Cognitive Impairment [MCI] and 15.9%
dementia due to Alzheimer's disease). The average BMI was 26.9kg/m2. 37.3% had normal BMI (18-25), 40.9% overweight (25-30), 21.2% obese (>30). Relative to normal-range BMI, those with overweight or obese range BMI had a significant negative association with PET Centiloid level (i.e. greater BMI had lower amyloid level). This remained significant for obese-range BMI in fully-adjusted models when restricted to NC participants. Obesity (BMI>30) was associated with greater hippocampal volume in the combined cohort, but this was not significant when restricted to NC only. Associations with total grey matter/ cortical volume and white matter hyperintensities were not significant. In the combined cohort (NC, MCI and AD) Obese-range BMI was associated with stronger performance on executive function and episodic memory, but not Attention. For NC-only, there was a significant negative association between Obesity and Attention performance. Neither Obesity category nor BMI were significantly associated with longitudinal change in amyloid (PET Centiloids), cognitive scores, nor MRI volumes.

Conclusion
Presence of obesity in later life was associated with lower brain amyloid levels in a mixed cohort including people with dementia, mild cognitive impairment and normal cognition. Obesity was not associated with longitudinal change in imaging biomarkers or cognition. Additional analyses are proposed for specific groups/interactions, including stratification by genetic risk, gender and age.

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MYC as a master regulator of dormancy in triple negative breast cancer

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Although five-year survival rates are high, one in ten breast cancer patients will relapse years to decades after diagnosis at which prognosis is very poor. Disseminated tumour cells (DTCS) can enter a dormant state allowing them to survive treatment and remain as a repository for cancer recurrence.

MYC, a well-known oncogene aberrantly regulated in many cancers, including breast, is involved in proliferation, tumorigenesis and diapause, a reversible halt on embryonic development. We hypothesise that reduced MYC expression induces dormancy in normally aggressive cells and that subsequent restoration of MYC activity leads to the continuation of cancer cell growth resulting in relapse.

We generated breast cancer cell lines with inducible suppression of MYC levels. When grown as mammary tumours in mice, MYC reduction greatly reduces primary tumour growth. Inducing MYC knockdown after tumour resection halts cancer cell growth in secondary organs. DTCs in lungs, livers, spine, and femurs are maintained in small clusters of cells, while control mice display many and large lesions. This dormant-like state can be sustained for over 32 days after tumor removal. Importantly, when MYC expression is restored, DTCs exit dormancy resulting in metastatic outgrowth and recurrence in the mice. Transcriptomic analysis of dormant MYC^{low} DTCs identified dormancy genes. High co-expression of the top upregulated dormant genes correlates with longer relapse-free survival in breast cancer patients. Next, clinical samples of breast tumours and resulting metastases will be probed for protein expression of this panel.

Taken together, these data indicate MYC plays a deciding role in the maintenance of dormancy in preclinical mouse models. Promisingly, the resulting dormancy signature is correlated with the clinical outcome of breast cancer patients. Future experiments will elucidate its potential as a prognostic tool that can stratify patients on risk for relapse.

Pharmacological inhibition of MYC by I-BET151 exposure phenocopies genetic knockdown, both *in vitro* and in mouse models, greatly suppressing metastatic outgrowth in preclinical mouse models.

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Magnitude and time to peak oxygenation effect of prone positioning in ventilated adults with COVID-19 related acute lung injury

Aim Prone positioning may improve oxygenation in acute lung injury (ALI) and was widely adopted in COVID-19 patients. However, the magnitude and timing of its peak oxygenation effect remain uncertain with the optimum dosage unknown. Therefore, we aimed to investigate the magnitude of the peak effect of prone positioning on the PaO_2:FiO_2 ratio during prone and secondly, the time to peak oxygenation.

Methods Multi-centre, observational study of invasively ventilated adults with COVID-19 ALI treated with prone positioning. Baseline characteristics, prone positioning, and patient outcome data were collected. All arterial blood gas (ABG) data during supine, prone and after return to supine position were analyzed. The magnitude of peak PaO_2:FiO_2 ratio effect and time to peak PaO_2:FIO_2 ratio effect was measured.

Results We studied 220 patients (mean age 54 years) and 548 prone episodes. Prone positioning was applied for a mean (±SD) 3 (±2) times and 16(±3) hours per episode. Pre-proning PaO_2:FIO_2 ratio was 137 (±49) for all prone episodes. During the first episode. the mean PaO_2:FIO_2 ratio increased from 125 to a peak of 196 ($p<0.001$). Peak effect was achieved during the first episode, after 9 (±5) hours in prone position and maintained until return to supine position.

Conclusions In ventilated adults with COVID-19 ALI, peak PaO_2:FIO_2 ratio effect occurred during the first prone positioning episode and after nine hours. Subsequent episodes also improved oxygenation but with diminished effect on PaO_2:FIO_2 ratio. This information can help guide the number and duration of prone positioning episodes.

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Sleep quality, depression, and anxiety in people with spinal cord injury and traumatic brain injury undergoing inpatient rehabilitation.

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Aim

Poor sleep, depression, and anxiety are prevalent secondary complications of spinal cord injury (SCI) and traumatic brain injury (TBI), and may interfere with recovery. This observational, exploratory study aimed to describe subjective and objective sleep quality, and levels of depression and anxiety in people with SCI and TBI undergoing inpatient rehabilitation; and to explore associations between sleep quality, depression, and anxiety.

Methods

Twenty-four patients admitted to two neurorehabilitation facilities following SCI (*n* =18) or TBI (*n* = 6) completed the Pittsburgh Sleep Quality Index, the Depression, Anxiety, and Stress Scale-21, and one week of actigraphy monitoring.

Results

Most participants reported poor subjective sleep quality (83%). Average depression and anxiety scores were within normal levels. Higher anxiety scores correlated with lower subjective sleep quality, longer sleep onset latency, and lower subjective total sleep time.

Conclusion

The findings suggest that targeting anxiety may improve sleep quality in inpatients with SCI or TBI, and *vice-versa.* Longitudinal and interventional studies are required to understand whether these relationships are reciprocal, and whether therapies targeting both sleep and mental health during inpatient rehabilitation can improve patient outcomes.

Title: Understanding the relationships between sleep quality, and depression and anxiety in neurotrauma: A scoping review.

Introduction: Sleep problems, depression, and anxiety are highly prevalent following a spinal cord injury (SCI) and traumatic brain injury (TBI) and may worsen functional outcomes and quality of life. This scoping review examined the existing literature to understand the relationships between sleep quality, depression, and anxiety in people with SCI and TBI, and to identify gaps in the literature.

Methods: A systematic search of seven databases was conducted. The findings of 30 eligible studies reporting associations between sleep quality and depression and/or anxiety following SCI or TBI were synthesised.

Results: The included studies were mostly cross-sectional and employed a range of subjective and objective measures of sleep quality. Poor subjective sleep quality and insomnia tended to be significantly associated with increased levels of depression and/or anxiety, but no such associations were reported when sleep quality was measured objectively. Two longitudinal studies observed worsening depressive symptoms over time were related to insomnia and persistent sleep complaints. Two interventional studies found that treating sleep problems improved symptoms of depression and anxiety.

Discussion: The findings of this review suggest that sleep and psychopathology are related in people with neurotraumatic injuries. This has important therapeutic implications, as individuals may benefit from therapy targeting both sleep and psychological issues. More longitudinal and interventional studies are warranted to further understand the direction and strength of the relationships, and how they impact patient outcomes.

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Rapid access chest pain clinic; insights from 10 years of an Australian experience.

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3. The Alfred Hospital, Melbourne, Australia;
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Background
Rapid Access Chest Pain Clinic (RACPC) is emerging as a successful model of care worldwide. Our study assessed the safety, efficacy, and cost-effectiveness of the RACPC at a large metropolitan health service in Australia.

Methods
A retrospective analysis of 3,984 patients who attended the RACPC between 2012 and 2022 was conducted. Purposed to benchmark our performance with national peers and examine the pattern and accuracy of requested cardiac imaging.

Results
The median waiting time from referral to consultation was 15.5 days. Attendance rates increased from 71% to 95% in the clinic's tenth year of operation. The most first test ordered was Treadmill Stress Echocardiogram TSE (49.8%), followed by CT Coronary Angiogram CTCA (42.4%), Invasive Angiography IA (2.3%) and Myocardial Perfusion Studies MPS (5.3%). 216 (5.4%) patients were discharged without any investigations ordered. The rate of non-invasive cardiac imaging resulting in IA for CTCA, TSE and MPS were 9.5%, 4%, and 10.1%, respectively. Revascularisation rates for positive IA, CTCA, TSE and MPS were 33.3%, 34.6%, 26.7% and 20%, respectively. At RACPC, an average of 419 patients/year were seen, costing around 94,783 AUD (226 AUD/patient). This indicates that the RACPC remains a cost-effective model of care, even if fewer than 5% of patients treated in the RACPC would have necessitated hospitalisation.

Conclusion
RACPC is a safe and efficient care model for managing low to intermediate CVD risk. CTCA is the preferred imaging modality due to its high diagnostic accuracy and positive predictive value.

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Rapid access chest pain clinic response to COVID-19 pandemic; a review of adaptation and performance

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Background
Rapid Access Chest Pain Clinic (RACPC) is an effective model of care that provides specialised and timely management of low-to-intermediate risk chest pain to minimise hospitalisation. In response to the COVID-19 pandemic, RACPC transitioned to virtual consultations and outsourced cardiac imaging to reduce face-to-face contact and minimise the risk of COVID-19 transmission.

Methods
We conducted a retrospective analysis comparing patients who attended virtual consultations during the pandemic with a pre-pandemic face-to-face consultation cohort. Attendance rate, modality of testing requested, waiting time and re-presentation rate to the clinic were assessed.

Results
In comparing the baseline characteristics of the two cohorts, there is no statistically significant difference in patients' age, gender and waiting time. During the pandemic, the number of patients seen increased from 502 to 579, the mean waiting time increased from 14 to 21.5 days, the attendance rate increased from 86% to 94%, and the number of patients re-presented to the clinic decreased (0.9% to 0.3%). The discharge rate without investigations remained the same (5.3% vs 5.5%). There was significantly less CT Coronary Angiogram and Invasive Angiography done during COVID19 pandemic. Conversely, significantly more Treadmill Stress Echocardiography and Myocardial Perfusion Studies were ordered during the pandemic compared to the pre-pandemic era.

Conclusion
Overall, at our institution, the transition to virtual consultations and outsourced cardiac imaging during the COVID-19 pandemic had no significant impact on the service provided by the RACPC. In fact, the rate of attendance has improved, although waiting time is prolonged.

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TITLE: Immunostaging to Improve the Prediction of Relapse Risk in Stage III Melanoma

Therapeutic management of stage III melanoma patients is challenging, due to the disease's heterogeneity and the availability of neoadjuvant and adjuvant therapies. These therapies are often accompanied by side effects, and high healthcare costs. Consequently, novel prognostic biomarkers that can identify patients likely to relapse are needed to tailor treatment approaches, minimize side effects, and improve patient outcomes.

This study used archival primary tumour and plasma samples collected at diagnosis from 100 treatment naïve stage III melanoma patients. An extensive examination of the immune landscape within the tumour microenvironment was conducted using custom multispectral immunohistochemistry in-house panels. Additionally, circulating tumour-specific antibodies against cognate tumour antigens were profiled using a custom in-house cancer array.

Our tissue-based findings revealed that the presence of γδ T cells in the tumour microenvironment correlated to melanoma prognosis, particularly when co-expressing BTN2A1 and BTN3A1. Additionally, the co-expression of MHC class I and II by melanoma cells correlated with enhanced T cell infiltration. Furthermore, in our blood-based results, we identified a unique signature of seven antigen specificities capable of distinguishing relapse from non-relapse patients. Employing a multivariate analysis, we developed a prognostic nomogram integrating the top five clinical, tumour, and blood parameters. This nomogram significantly enhanced the accuracy of relapse risk prediction in stage III melanoma, particularly for patients diagnosed with stage IIIB disease.

T cell factor 1 (TCF1) defines $CD8^+$ T cell subsets in colorectal carcinoma and predicts better prognosis

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Abstract

Tumour infiltrating lymphocytes (TILs), including $CD8^+$ T cells play a critical role in defence against colorectal carcinoma (CRC). Immune checkpoint inhibition (ICI) is used to treat metastatic CRC with successful treatment of mismatch repair deficient (dMMR) tumours and impressive results are beginning to emerge in earlier stage disease (1, 2). In clinical settings, only dMMR tumours are considered for ICI because they are rich in TILs and neoantigens, however we found that overall 24% of stage III CRCs had high frequencies of TILS (TIL-hi), including 64% of dMMR and 15% of mismatch repair proficient (pMMR) tumours. Precursor to exhausted (T_{pex}) $CD8^+$ T cells play a critical role in maintaining robust immune responses following ICI treatment. T_{pex} cells express the transcription factor T cell factor 1 (TCF1, encoded by the gene *Tcf7*), which also plays a critical role in T_{pex} differentiation (3, 4). In stage III CRC, we found the presence of $TCF1^+CD8^+$ T cells predicted better patient prognosis compared with total $CD8^+$ T cells. We found that T_{pex} cells ($CD8^+TCF1^+PD\text{-}1^+$) were located in all regions of CRC primary tumours, but were most abundant within lymphoid aggregates. In contrast, exhausted $CD8^+$ T cells (T_{ex}) ($CD8^+TCF1^-PD\text{-}1^+$) were most abundant at the invasive front and within tumour tissue. Interestingly, comparison of TIL-hi dMMR and TIL-hi pMMR CRCs revealed no difference in the frequency of T_{pex} cells. These results highlight that both dMMR and pMMR TIL-hi tumours support high quality $CD8^+$ T cell responses. Our findings warrant further research investigating the role of T_{pex} cells in CRC and suggest that ICI could be an effective treatment for both TIL-hi dMMR and pMMR CRCs.

Title:
Responding to the Patient Voice: Evaluation of a PROMs Dashboard in Orthopaedic Surgery Outpatient Clinics

Aims:
Patient Reported Outcome Measures (PROMs) are valuable in predicting revision rates and patient satisfaction in hip and knee arthroplasty; however, they can also enhance the quality of patient care in the clinical environment improving communication between patients and clinicians, validating the patient experience, and facilitating shared decision-making. Previously published literature on clinical use of PROMs has demonstrated that while patients welcome the concept, several barriers to implementation exist, including logistic, technical, and social issues, along with clinician reluctance. The aim of this study is to evaluate clinician usage and acceptance of a digital PROMs Dashboard in the outpatient orthopaedic clinic setting, to assess the scope and scale of the Dashboard within orthopaedic surgical care, and to demonstrate the generalisability of this application of PROMs.

Method:
Evaluation surveys developed within the Unified Theory of Acceptance and Use of Technology (UTAUT) framework are completed by clinicians (Orthopaedic Surgeons and Musculoskeletal Physiotherapists) to assess perceptions before and after, using the PROMs Dashboard. Evaluation data is used to tailor the Dashboard in real time to suit the clinicians using it and promote engagement. Frequency of use data will also be obtained from the Dashboard report.
Results: Early results suggest that clinicians believe the Dashboard will enhance their understanding of a patient's condition; 40% agreed and 60% strongly agreed with this statement. 100% of clinicians also believed it would validate the patient experience. However, there was some uncertainty (20%) around whether the Dashboard would be easy to find within the hospital IT systems and reluctance (40%) to look at an additional computer program during clinic consultations. Further results are pending the post-use survey which will be sent to clinicians in July 2023.

Conclusion:
This evaluation research addresses some of the barriers to implementing PROMs in the clinical setting. To improve the quality of patient-centred care, it is not enough just to give patients the opportunity to provide their voice via PROMs, clinicians must hear and respond to these voices at the point of care.

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Co-Authors: Andrew Hardidge, KC Cheah, Hung Vo

Title: Elucidating contributions of side-population markers in placentas of human placental insufficiency

Authors and Institution:

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AIMS

Establishing/maintaining placental cell types is critical to placental development, enabling downstream pregnancy function. When such processes are disrupted, placental insufficiencies (PI) including preeclampsia and fetal growth restriction (FGR) can arise. Emerging hypotheses suggest a placental stem cell subpopulation gives rise to essential placental cell populations (namely invasive extravillous trophoblasts (EVTs) and multinucleated syncytiotrophoblasts) that may be dysregulated in PI. Recently, 'side-population' cells postulated to represent these placental stem cells were isolated from human placenta and identified by eight marker genes (Gamage et al 2020, *Stem Cell Reviews & Reports*). We assessed side-population markers in preeclampsia, FGR, and differentiating human trophoblast stem cells (hTSCs) into EVTs/syncytiotrophoblasts.

METHODS/RESULTS

ELL2, GATA6, HK2, HLA-DPB1, IL-8, INTS6, SERPINE3 and *UPP1* mRNA expression was measured in <34-week human placenta (n=78 preeclampsia, n=30 FGR, n=18 gestation-matched controls). *ELL2, HK2* and *IL-8* mRNA were elevated in preeclamptic ($p=0.0006$, $p<0.0001$, $p=0.0335$ respectively) and FGR placentas ($p=0.0065$, $p<0.0001$ $p=0.0001$ respectively). Conversely, *GATA6* reduced in preeclamptic/FGR placentas ($p=0.0014$, $p=0.0146$ respectively). Further stratification suggested ELL2, *GATA6*, *HK2* and *IL-8* alterations were strongly influenced by preeclampsia ($p=0.0028$, $p=0.0020$, $p<0.0001$, $p=0.0048$ respectively). *INTS6* reduced in FGR-exclusive placentas ($p<0.0001$).

For hTSC differentiation into EVTs (n=5), successful differentiation was confirmed by reduced hTSC marker, *TEAD4* ($p<0.007$); and elevated EVT marker, *HLA-G* expression ($p<0.026$). *ELL2, GATA6, HK2* and *INTS6* increased with EVT differentiation ($p=0.0015$, $p=0.0018$, $p<0.0257$, $p<0.0261$), but *CXCL8* did not change. *TEAD4* loss ($p<0.018$) and elevated *SDC1* ($p<0.0223$) confirmed syncytiotrophoblast differentiation (n=5). *CXCL8* and *GATA6* expression was unchanged with syncytialisation, but *ELL2, HK2* and *INTS6* expression increased with syncytialisation ($p<0.0407$, $p<0.0414$, $p=0.0257$).

Finally, multiplex immunofluorescence visualised side-population marker co-localisation, and therefore potential side-population cells. This analysis is currently underway.

CONCLUSION

We provide indirect evidence placental side-population cells may be dysregulated in PI. Differing expression of these genes between FGR/preeclampsia hint that their pathogeneses may differ.

Background: Prostate cancer is the most commonly diagnosed cancer and contributes the second highest cancer death rate in Australian males. The demand for ^{68}Ga-PSMA scans for both staging and therapy monitoring has increased in the past few years.

Aims: Compare time of production and percentage yield between Illucix® cold kit and an automated radiosynthesizer. Evaluate radiochemical purity with both HPLC and TLC for both methods of production.

Methods: For Illucix® cold kit, Galli Eo Gallium-68 generator was used and radiosynthesis procedure followed as per manufacturer's product information.
For automated ^{68}Ga-PSMA production, Eckert and Ziegler Gallium-68 generator was used with iPhase radiosynthesizer and precursor sourced from ABX.
HPLC with Shimadzu Prominence system and LabLogic Flow Ram radio-HPLC detector for radiation detection. Phenomenex Kinetex 5 micron C18 (150 x 4.6mm) analytical column was used as a stationary phase. Water with 0.1% TFA (A) and acetonitrile with 0.1%TFA (B) as mobile phase at a flow rate of 1.5mL/min with gradient elution for analysis over 15 minutes, UV detector wavelength set at 240 nm.
iTLC with Silica gel glass fiber strip as stationary phase developed in 1M ammonium acetate:methanol (1:1) was used to quantify free ^{68} Ga (III) ion and colloid.

Results: Eight productions with Illucix® cold kits was performed, with an average production time of 10 minutes and 99% labelling yield. Twelve automated ^{68}Ga-PSMA productions with an average production time of 17.3 minutes and 67.4% labelling yield.
Quality control results were similar with TLC and HPLC being 99.5% and 99.9% for Illucix® cold kit and 99.3% and 99.7% for automated ^{68}Ga-PSMA radiosynthesizer respectively.

Conclusion: Illucix® cold kit offers a quicker synthesis time and higher labelling yield compared with our in-house radiosynthesizer. With a higher average labelling yield of Illucix cold kit compare with ^{68}Ga-PSMA automated radiosynthesizer an extra patient dose per production is possible.

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Utilisation of CT for the assessment of trauma patients following institution of a dedicated trauma surgical service at Austin Hospital

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Aim
Computed Tomography (CT) imaging is essential in initial assessment of the trauma patient. Our aim was to assess CT scan utilization following introduction of a trauma surgical service for patients presenting to the Emergency Department (ED) at our institution in 2022, in comparison to a historical baseline period. We investigated initial CT coverage, subsequent scans, prevalence of positive scans, and turnaround time from presentation to initial scan.

Methods
Single-centre retrospective cohort analysis of adult patients who presented to the ED with trauma, excluding isolated extremity and low-impact isolated head trauma, who underwent CT scans as part of work-up from October – December 2022, compared to the same period in 2019, using Wilcoxon ranked sum for continuous and Fisher's exact test for categorical variables.

Results
Analysis was performed on 207 patients (n=105, 2019, n=102, 2022). There was no significant difference in median age (72 vs 76.5y), gender (43.4% vs 57.0% male), factors inhibiting communication or evidence of significant trauma between both groups (p >0.05). There was an increase in proportion of whole-body CT scans performed in 2022 (19.0% vs 49.0%, p<0.001). The median number of regions scanned was 2 in those who did not undergo an initial whole-body CT. Waiting times for CT increased significantly in 2022, median159[IQR114-232] to 193.5[139-2247] minutes, p=0.04. There was an increase in additional CT scans performed in 2022 (15.8% vs 7.6%, p=0.08) with no significant difference in turnaround times for additional scans. Almost half of initial CT scans were positive in 2022 (35.2% vs. 47.05%, p=0.12) and a third of additional scans were also positive (44.4% vs. 33.3%).

Conclusion
We observed increase in the number of whole-body CT scans performed in trauma patients at our institution following introduction of a dedicated trauma surgical service. Further evaluation of positive findings per body region scanned and patient outcomes is still ongoing.

References Nil