Error and underestimation: capturing psychiatric complexity in disorders of gut-brain interaction

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1 INTRODUCTION

Disorders of gut-brain interaction (DGBI) are common, affecting 37.7% of Australians [1].

DGBI arise from past and present psychosocial stressors, via a complex interplay of nervous system, immune dysfunction, microbiome and mucosal-barrier dysfunction [2].

Whilst the prevalence of comorbid psychiatric disorders in DGBI is well established, medical literature oversimplifies the psychiatric profile of this population. Most studies use anxiety and depression self-reported screening measures for diagnosis [1].

Further, GI-psychologists and psychiatrists are few in medical services, leaving diagnosis to the primary physician.

This study aimed to compare the psychiatric profiles of patients with DGBI, pre- and post-psychologist formulation.

2 METHOD

Retrospective cohort study in a metropolitan tertiary-level adult hospital, specialist multidisciplinary outpatient clinic.

Inclusion criteria: consecutive patients who completed full neurogastroenterologist and gastro-psychologist assessment January 2023 to May 2024.

Diagnoses were recorded using Rome IV, DSM-5 and ICD-11 diagnostic criteria.

3 RESULTS

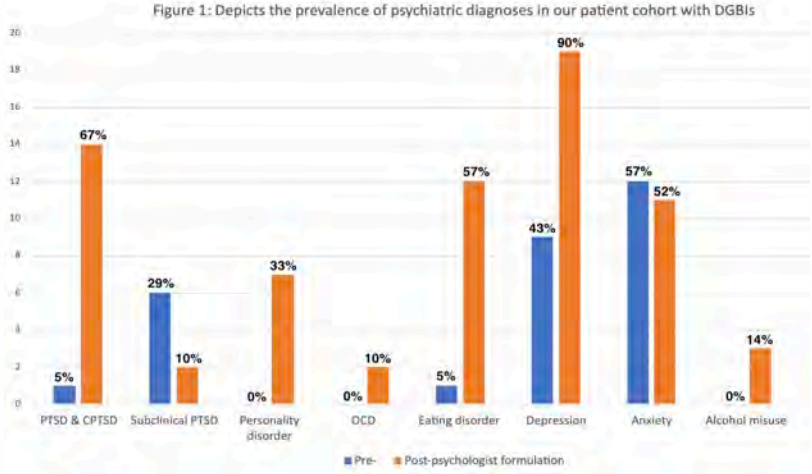
21 consecutive patients were included, 76% female, mean age 44.

This represents a complex DGBI cohort, **57% had 3+ DGBI diagnoses**, most commonly chronic nausea vomiting syndrome (52%), centrally mediated abdominal pain (43%), functional dyspepsia-postprandial distress syndrome (38%), and defecation disorders (33%).

Prior to gastro-psychologist assessment, based on referral documentation and patient history, the primary psychiatric diagnosis was:

> Anxiety or major depressive disorder	71%
> Post-traumatic stress disorder (PTSD)	5%
> Complex-PTSD (C-PTSD)	0%
> Subclinical PTSD	29%
> Active eating disorder	5%
> Personality disorder	0%
> No psychiatric history	24%

Figure 1: Depicts the prevalence of psychiatric diagnoses in our patient cohort with DGBIs



Vastly more psychiatric complexity was uncovered following gastro-psychologist formulation (Figure 1):

All met diagnostic criteria, with 52% suffering 3+ comorbid psychiatric disorders:

> C-PTSD	62%
> PTSD	5%
> Active eating disorder	57%
> Restrictive eating disorder	52%
> Personality disorder	33%
> Persistent pain disorder	76%

4 CONCLUSION

There is a complexity of psychiatric comorbidities contributing to DGBI, misdiagnosed as anxiety or depression in primary care, and not captured by standard clinical questionnaires.

C-PTSD was the most significant diagnostic change, key to complex DGBI, as it includes the symptoms of PTSD plus disrupted emotional regulation, self-concept and relationship difficulties [3]. Eating, personality, and pain disorders are also unrecognised.

We advocate for an **integrative multidisciplinary approach with specialist psychological assessment & formulation** to inform successful patient outcomes & reduce risk of iatrogenic harm.

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Metro North Health | Neonatology

EPINO: Study protocol of the Early Predictors of Infant Neurodevelopmental Outcomes Study,

part of the NHMRC Cerebral Palsy Synergy Program

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Background/Objectives:

Most children (70%) who go on to have cerebral palsy (CP) have an associated non-progressive brain injury, malformation or disturbances that are sustained before birth,1 however their CP diagnosis is often not confirmed until approximately 2 years of age, and only 50% receive rehabilitation before 1-year of age. Despite the gains made using early MRI and clinical assessments such as the General Movements Assessment (GMA) at 3-4 months there are limited biomarkers to detect these brain disturbances in the first months of life. Our study aims to (i) identify infants with high chance of CP very early based on a combination of imaging (Magnetic Resonance Imaging, Electroencephalogram), clinical and genetic and blood biomarkers which will lead to earlier referral to intervention and improved outcomes including cost and consequences at two years.

Methods/Analysis:

High-risk infants born very preterm, small and/or with early brain injury including stroke or hypoxic encephalopathy will be recruited in the neonatal period (from delivery till Term Equivalent Age TEA) (n=425). A comprehensive battery of early biomarkers (MRI including structural, diffusion *(Fig. 1. and 2.)*; high density EEG; Clinical including Hammersmith Neonatal Newborn Examination (HNNE), General Movements Assessment (GMA)/General Movement Optimality Score (GMOS)/Motor Optimality Score-Revised (MOS-R); Genetic and Molecular) will be collected in the neonatal period (birth to 4 months c.a.). Comprehensive outcomes will be assessed using standardized measures of neurodevelopment, cognition, gross and fine motor skills, feeding and growth, diagnosis of CP, Developmental Delay, Autism Spectrum Disorder (ASD) and Fetal Alcohol Spectrum Disorder (FASD). Standardised assessments include (GMA/GMOS/MOS-R, Hammersmith Infant Neurological Examination [HINE], The Social Attention and Communication Surveillance-Revised [SACS-R], The Bayley Scales of Infant and Toddler Development 4th Edition [BSID IV], Peabody Developmental Motor Scales 3rd Edition [PDMS-3]), and questionnaires will be administered to assess biomarkers of neurodevelopment and associated risk factors up till 24 months corrected age (c.a.) with the plan to continue with longer term follow-up.

Results and Conclusion:

Comprehensive outcomes will be assessed using standardized measures of neurodevelopment, cognition, gross and fine motor skills, feeding and growth. Confirmation of the risk of cerebral palsy and other adverse neurodevelopmental outcomes in children will typically occur around the age of two years c.a.
A cost-consequence analysis will be conducted comparing receipt of early diagnosis versus later diagnosis of cerebral palsy compared to an earlier prospective cohort.

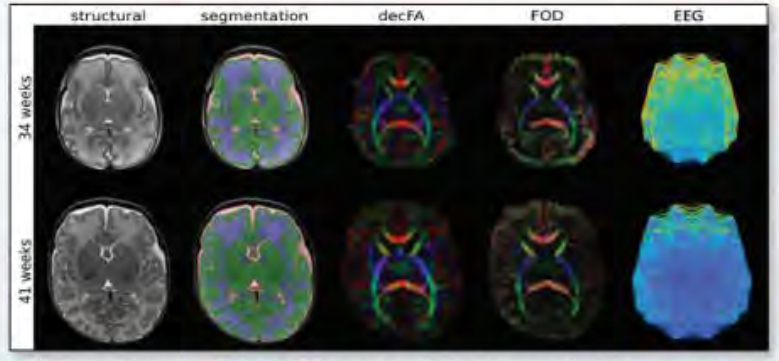

Fig. 1. sMRI and dMRI obtained from VPT infant at 34 (top) and 41 wks (bottom) PMA. sMRI shows ongoing brain folding; automated brain segmentation enables assessment of different tissue types; colour encoded fractional anisotropy (decFA) from dMRI shows major white matter pathways laid out at 34w PMA, while the fibre orientation distribution (FOD) shows directionality of WM pathways and radial organisation of cortex at 34w PMA. EEG shows theta-band functional connectivity during quiet sleep.

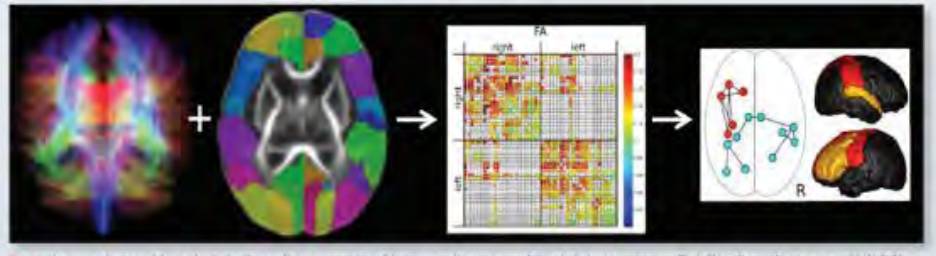

Fig. 2. Automated connectivity analysis pipeline, outlining generation of the structural connectome from whole brain tractogram (far left) and parcellated structural MRI (left). Graph theory approaches (right and far right), such as Network Based Analysis, are used to statistically identify brain networks at different stages of maturation or altered due to early interventions.

Ethics Approval HREC/22/QCHQ/85661, UQ/HREC/2022/HE001238

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

QUT Centre for Immunology and Infection Control | QIMR Berghofer Medical Research Institute THE FUTURE OF HEALTH | CSIRO Australian e-Health Research Centre | The University of Queensland AUSTRALIA CREATE CHANGE | HERSTON HEALTH PRECINCT | RBWH Foundation | QUT | Metro North Health | Queensland Government

Intravenous iron staining – evaluation of a 7-year quality improvement project

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Image source: Canning M, Grannell L. A stain on iron therapy. Aust Prescr. 2020;43(5):160-163. doi:10.18773/austprescr.2020.051

Background

Iron deficiency is the leading cause of anaemia worldwide and is increasingly treated with intravenous (IV) iron. Staining from IV iron therapy is a rare but significant adverse effect. A health service wide quality improvement project was undertaken over a 7-year period which developed and implemented a standardised best practice IV iron procedure.

Aim

To evaluate the impact of a long-term health service wide quality improvement project on IV iron staining rates, severity of stains preventability.

Methods

IV iron stains reported between 2016 and 2022 across Metro North were identified from the clinical incident reporting system (RiskMan) and a retrospective chart audit was undertaken. Iron staining incidence rates were calculated using iron distribution data from the pharmacy information system (i.Pharmacy) and stain size (severity) extracted from clinical notes. Preventability was assessed by measuring adherence to best practice principles contained within the best practice procedure.

Results

In total there were 103 iron stains reported and an estimated 33,056 iron infusions, resulting in a real-world incidence rate of 0.31 stains per 100 infusions. There was nil change in staining rate over the 7-year period (pre 0.27%, post 0.34%, p=0.25) however staining rates are lower than those reported in the literature (0.68 stains per 100 infusions). Table 1 displays changes in compliance to best practice principles. Smaller stain sizes were associated with infusion cessation at identification of extravasation (See Table 2) Preventability was assigned to 86% of stains.

Table 1 - Pre- and post-compliance to best practice principles

Best Practice Principles	Compliance % (n)						Fischer's exact test P value
	Pre-implementation (Total cases = 38)			Post-implementation (Total cases = 65)			
	Yes	No	Missing	Yes	No	Missing	
1. Did the patient meet clinical criteria for use of IV iron therapy?	63.4 (18)	35.7 (10)	26.3 (10)	54.7 (29)	45.3 (24)	18.5 (12)	0.48
2. Was the medication order reviewed by a pharmacist?	61.8 (21)	38.2 (13)	10.5 (4)	89.7 (52)	10.3 (6)	10.8 (7)	<0.01
3. Was the statewide Iron Infusion Consent form completed?	27.3 (21)	72.7 (56)	14.4 (13)	76.9 (10)	23.1 (3)	0.0 (0)	<0.01
4. Was the patient informed of the risks, benefits, and alternative treatment options?	42.4 (14)	57.6 (19)	13.2 (5)	79.3 (46)	20.7 (12)	10.8 (7)	<0.01
5. Was the cannula site appropriate?	14.3 (4)	85.7 (24)	26.3 (10)	52.5 (31)	47.5 (28)	9.2 (6)	<0.01
6. Did vital sign monitoring occur?	27.3 (9)	72.7 (24)	13.2 (5)	46.6 (27)	53.4 (31)	10.8 (7)	0.08
7. Did cannula site monitoring and documentation occur	9.1 (3)	90.9 (30)	13.2 (5)	20.7 (12)	79.3 (46)	10.8 (7)	0.24
8. Was the infusion stopped when potential extravasation identified?	87.0 (20)	13.0 (3)	13.2 (15)	83.0 (44)	17.0 (9)	18.5 (12)	>0.99

Table 2 – Stain surface area analysis

	Median (cm² [IQR])	P value
Implementation phase (n=25)		
Pre-implementation	50.24 (42.0 – 264.0)	0.13
Post implementation	35.0 (14.0 - 113.25)	
Cannula site (n= 25)		
Cubital Fossa	50.0 (12 to 246)	0.76
Non-Cubital Fossa	45.0 (23.5 – 112.8)	
Cannula site monitoring (n=24)		
Did not occur	50.0 (19.6 - 150)	0.62
Occurred	35.0 (14.0 - 185.5)	
Action when potential extravasation identified (n = 18)		
Infusion not stopped	312.0 (36.5 – 352.0)	0.04
Infusion stopped	35.0 (10.0 – 135.5)	

Conclusion

The real-world IV iron staining rate is 0.31 stains per 100 IV iron infusions. Early identification and infusion cessation results in smaller stains. A large proportion of iron stains are preventable.

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

Assessing the Readability of Colon Cancer Information Generated by Large Language Models

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Introduction

Colon cancer is the second deadliest and third most common cancer in the United States.[1] Therefore, it is important for the public to understand certain useful information regarding colon cancer, including risk factors, screening methods, and prevention strategies. Large language models (LLMs) have improved patient autonomy through customized education. However, the readability of the responses from these programs in the context of colon cancer patient education has not been thoroughly assessed. The National Institute of Health (NIH) recommends that medical information for the general public is written at a sixth-grade level.[2] This study investigated the readability of responses to questions specific to colon cancer using three of the most popular LLMs: ChatGPT, Google Gemini, and Meta AI.

Methods

Ten questions that an average adult in the United States may enquire about colon cancer were used as input in each LLM (Figure 1). Subsequently, each interface was tasked with revising the output to match a sixth-grade reading level. Each output set was analysed and assigned a Flesch-Kincaid readability score. Statistical analysis of the data was performed using GraphPad Prism 10.2.3.

Figure 1: LLM Input

1. What is colon cancer?
2. What are the symptoms of colon cancer?
3. What are the risk factors for developing colon cancer?
4. How do I prevent colon cancer?
5. How is colon cancer staged?
6. How is colon cancer screened?
7. How is colon cancer diagnosed?
8. What are the treatments for colon cancer?
9. What happens after colon cancer treatment?
10. What is the prognosis for colon cancer patients?

Figure 2: Flesch-Kincaid Readbility Scores

	ChatGPT		Meta AI		Google Gemini	
	Normal	6th grade	Normal	6th grade	Normal	6th grade
Question 1	44.1	75.3	67.1	86.4	67	70.8
Question 2	60.7	82.2	69.7	76.7	71.1	81.8
Question 3	41.4	70.5	52.4	62.4	66.6	81.1
Question 4	49.1	86.7	55.9	67.8	69.2	74.4
Question 5	72.5	87.6	31.4	88.1	74	85.7
Question 6	45.5	81.6	49.3	80.8	57.1	73.3
Question 7	53.9	71.9	56.3	81.9	55.6	67.8
Question 8	53.3	67.8	69.2	60.5	53.1	66.7
Question 9	36	79.8	49.6	71.8	60.6	81.5
Question 10	40.4	74.9	46.8	67	45.9	77.3
Average Value	49.69	77.83	54.77	74.34	62.02	76.04
P-value	<0.0001		0.0007		0.0011	

Results

The average Flesch-Kincaid readability scores for initial output from ChatGPT, Meta AI, and Google Gemini were 49.69, 54.77, and 62.02, respectively (Figure 2). The average scores for the sixth-grade level outputs were 77.83, 74.34, and 76.04, respectively. Each LLM demonstrated statistically significant improvement in readability after adapting output to a sixth-grade level with the following respective p-values: <0.0001, 0.0007, and 0.0011.

Discussion

ChatGPT, Google Gemini, and Meta AI each demonstrated statistically significant increases in Flesch-Kincaid scores between both sets of output, indicating an improvement in readability. The results of this study suggest that LLMs are potential tools that may improve patient autonomy through customised education. Future studies could expand on this work by utilising a larger question set as input, tailoring questions to different clinical presentations, and including other LLMs to further investigate this topic.

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DOSING, EFFICACY AND SAFETY OF RITUXIMAB FOR THE TREATMENT OF MINIMAL CHANGE DISEASE IN ADULTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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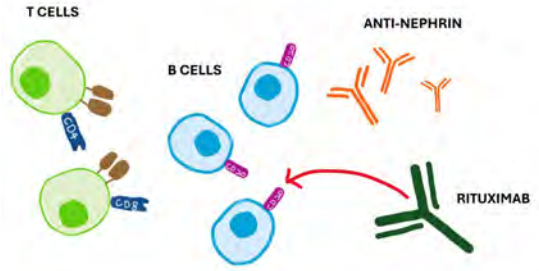
AIM

- To examine dosing, efficacy and safety of rituximab in treating minimal change disease (MCD) in adults.

BACKGROUND

- MCD accounts for 10-15% of nephrotic syndrome in adults [1].
- It has propensity to relapse (~70%) [2]
- High-dose corticosteroids are considered first-line treatment. [1]
- Other immunosuppressants (calcineurin inhibitors, cyclophosphamide, mycophenolate and rituximab) are reserved for frequently-relapsing (FRMCD), steroid-dependent (SDMCD) or resistant (SRMCD) disease. [1]
- The pathophysiology of MCD is complex [3]
    - Initially thought to be T-cell derived
    - Emerging evidence implicates B-cells
    - The recent discovery of anti-nephrin antibody supports this hypothesis
- Rituximab, an anti-CD20 monoclonal antibody, offers potential benefits by reducing corticosteroid exposure, costs and improving tolerability/compliance.

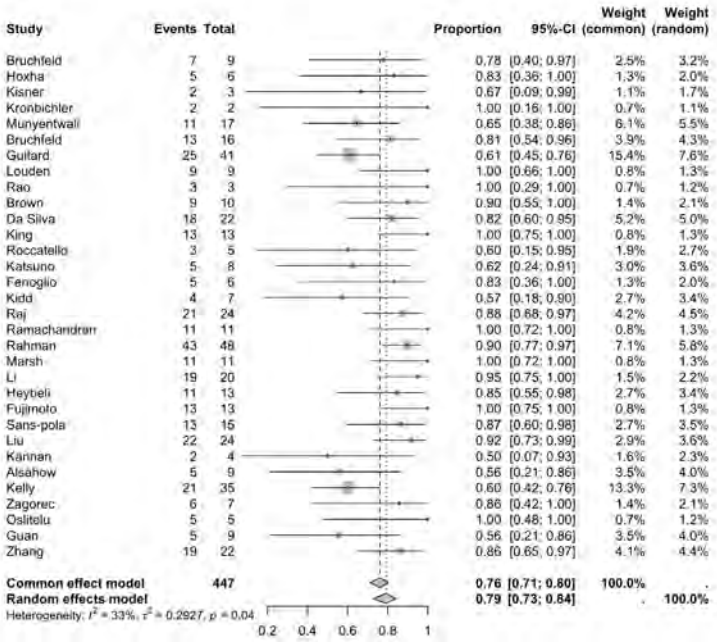
FIGURE 1: PATHOPHYSIOLOGY



METHODS

- Registered with PROSPERO (CRD42024525391), complied with PRISMA guidelines
- Strategic search of PubMed, EMBASE, CINAHL, Cochrane and CKN databases .
- Inclusion criteria: age ≥16 years, size (n≥2), native kidney biopsy-proven MCD, follow-up ≥6 months and induction treatment
- Subgroups defined as
    - Low-dose: cumulative induction dose = single-dose 375mg/m^2 or ≤1g rituximab
    - High-dose: cumulative induction dose >1g rituximab
- Random-effects model meta-analysis was performed to evaluate the pooled proportion achieving complete remission (CR) and subgroup meta-analysis compared high- and low-dose groups.

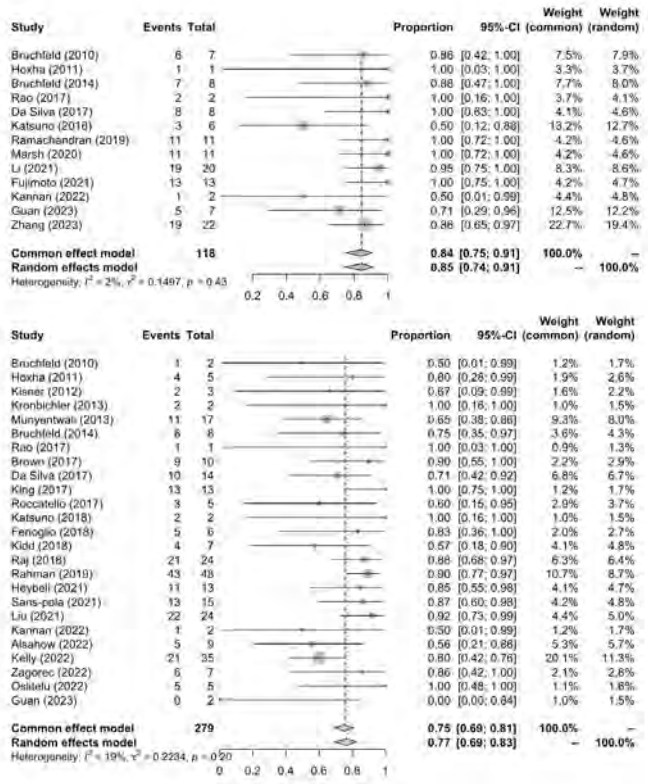
FIGURE 1: TOTAL COHORT META-ANALYSIS



RESULTS

- The search revealed 1264 studies of which 32 were included in the review.
- Studies were excluded primarily for age <16 years, cohort size <2 and pooled cohorts of multiple glomerular disorders
- Included studies were all observational.
- The pooled CR was 0.79 (0.73-0.84) for the total cohort.
- The low-dose group demonstrated CR 0.85 (0.74-0.91) and high-dose CR 0.77 (0.69-0.83).
- Sustained remission at 12 months was 80% (low-dose) and 61% (high-dose).
- 69% (low-dose) were steroid-free at last follow-up compared to 61% (high-dose).
- Reported adverse events were minimal.

FIGURE 2: SUBGROUP ANALYSIS



CONCLUSION

- Rituximab is safe and efficacious for treating MCD in adults.
- Current review demonstrates that low-dose rituximab is as effective as high-dose.

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A Nurse Practitioner led home visit model in kidney supportive care

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Background

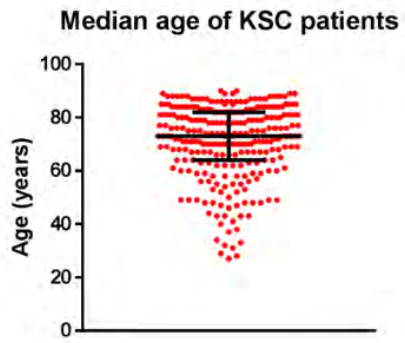
Access to outpatient kidney supportive care (KSC) is difficult for people with advanced kidney failure who are living with frailty in residential aged care facilities (RACF) or at home. Delivering the appropriate care to these patients who have significant KSC needs is challenging, with high numbers of 'failure to attend' appointments.

Aim

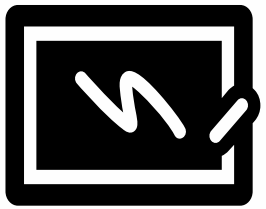
To improve access to KSC care for people with advanced kidney failure who are unable to attend outpatient clinics due to frailty.

Methods

During the period October 2023-May 2024, data on demographic profile, number and frequency of appointments, Charlson Comorbidity Index (CCI), Clinical Frailty Scale (CFS); symptom experience and management (IPOS-Renal); health-related quality of life (EQ5D5L); patient/carer satisfaction and completed advance care planning were extracted from REDCap data management system.



Median co-morbidity score = **7**
(range 2–13)



100% of KSC pt's have documented ACP on iemr

Results

Twenty-eight patients received a home visit, on average, every 3 months, (average age 81; range 67-91 years). Average clinician-reported scores were 7 for CCI and 6 for CFS, while average patient-reported scores were 10 for IPOS-Renal and 50 for EQ5D5L. Patient/carer satisfaction was high and 100% of visited patients have documented some form of ACP. All the patients who have met the home visiting criteria have agreed to the initial and ongoing NP visits.

97% patients and carers satisfied with KSC HV care

Conclusions

The NP led home visiting KSC service allows access to care that, until now, was beyond reach for those who were unable to attend clinic appointments due to frailty. Evaluation of the home visiting service is ongoing and will be reported on at 12 months.

How is Point-Of-Care 3D Printing Influencing Medical Device Innovation? A survey on the Herston Health Precinct

Mathilde R. Desselle[1,2,3], Michael Wagels [1,3], Marianella Chamorro-Koc [4], Glenda A. Caldwell [2]

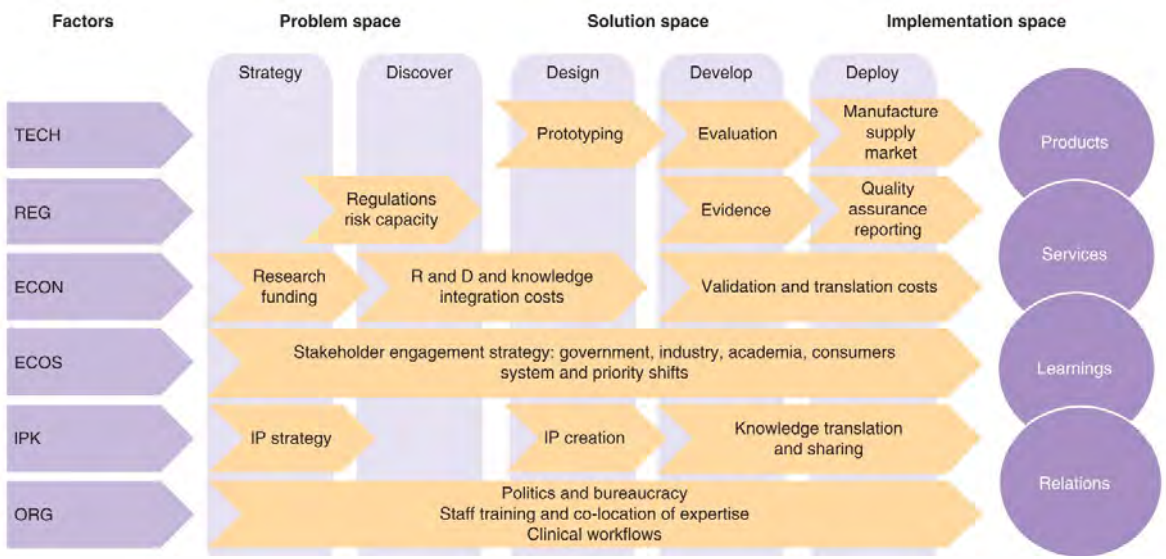
Aims

1. To understand the role point-of-care **3D printing is playing in medical device innovation**;
2. to articulate tangible and intangible benefits of **open social innovation models** with internal and external stakeholders;
3. to identify key considerations to support **implementation of 3D printing in public hospitals.**

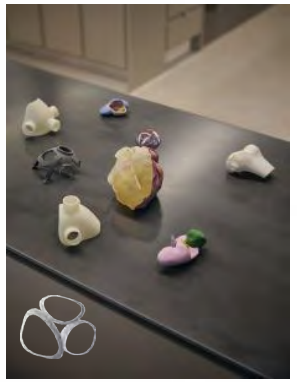
Methods

Survey on the Herston Health precinct to understand the relationships between technology, regulations, economics, ecosystem dynamics, intellectual property management and organisational factors (**TREEIO model**).

Results



- N= 68 participants, majority of employees of a health service (82%)
- 3D printing is more relevant to the solution space of the device design cycle.
- 3D printing influences organisational culture and how users navigate the regulatory framework.
- Access to on-site 3D printing technology stimulates collaboration and rapid design cycles.
- Open innovation approaches can help reconcile motivations to engage in medical device R&D, as well as social and economic benefits.



Discussion

1. 3D printing technology is perceived as **an enabler rather than a driver** of medical device innovation in hospitals, with universities as key collaborators rather than industry.
2. Some participants in this study expressed some **reluctance at openness as a risk of losing their competitive advantage**.
3. There is a **paucity of safety data on 3D printing materials and silicones labelled 'medical grade'** currently on the market. Caution must be exerted in selecting the right materials for any given device by checking for **standards compliance**.
4. A **roadmap for design validation and transfer** should form part of the activities conducted as part of the medical device innovation activities.

Future work

Development of an **open innovation framework**: designing for the system, enabling transdisciplinarity, understanding value, and establishing openness rules

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3. Faculty of Medicine, The University of Queensland
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Documented advance care plans in adults with chronic kidney disease: A systematic review

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Background

Patients with chronic kidney disease (CKD) require advance care planning (ACP) to ensure their voice is heard in the planning of future healthcare and treatment options, with risks and benefits of those options weighed against their personal preferences.
Documenting ACP is a powerful way to communicate patients' choices to their wider community of healthcare providers.

Aim

To assess rates of documented ACP in CKD populations.

Methods

A systematic review of English language studies published between January 2011 and December 2023 retrieved from Medline, PubMed and Cumulative Index to Nursing and Allied Health Literature databases (Figure 1). Inclusion criteria were adults with CKD and reporting ACP (including directives, enduring power of attorney). Two review authors identified studies for full review, data extraction and quality assessment. Data synthesis and quality assessment followed the Joanna Briggs Institute quality appraisal checklist.

Database	Search Strategy – January, 2011 – December, 2023, English, peer reviewed articles	Search results n=748
Medline	Advance care planning AND chronic kidney disease or end stage kidney disease or chronic renal insufficiency or renal failure AND documentation or directive or acute resuscitation plan	303
EBSCO	Advance directive or advance care planning or living will or power of attorney AND renal failure or kidney failure or chronic kidney disease AND order OR document	127
CINAHL	Advance care planning or end of life planning or advance directive or advance care plan or advance decision or advance healthcare plan AND renal failure or kidney failure or chronic renal failure AND documented information	182
PubMed	Advance directive or advance care planning or living will or power of attorney AND renal failure or kidney failure or chronic kidney disease AND order OR document	136

Figure 1: Search strings and results

Results

Twenty-one studies met the inclusion criteria with n= 305,033 participants (see figure 2). Three studies were randomised control trials, 14 cross-sectional and the remaining 4 were either case-control or qualitative descriptive designs. Rates of documented ACP ranged from 5% to 89% (median 37%). Challenges to completing ACPs were length of time to complete, clinician role ambiguity and lack of reimbursement attached to the ACP process.

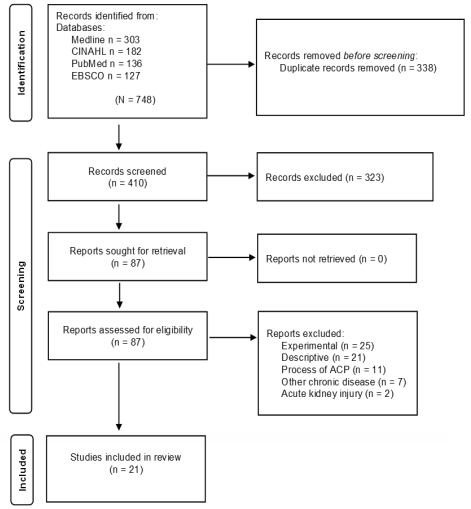

Figure 2: PRISMA flow diagram of included studies

Conclusions

Documented ACP rates for patients with CKD are suboptimal. This is a significant gap in current care of people with CKD, with understanding current rates and challenges associated, an important first step to improvement.

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SEE AUTHOR FOR ENTIRE LIST

Infection and all-cause failure of peripheral intravenous catheters: A systematic review and meta-analysis

Marsh N[1-3], Larsen E[1-3], Ullman A[1,2,4], Mihala G[2], Cooke M[3], Ray-Barruel G[2,5], Rickard CM[1,2,3,5]

[1]Nursing and Midwifery Research Centre, Royal Brisbane & Women's Hospital; [2]University of Queensland; [3]Griffith University, [4]Queensland Children's Hospital, [5]Herston Infectious Diseases Institute

Introduction

Peripheral intravenous catheters (PIVC) are the most common invasive medical device in hospitals, yet they are frequently associated with complications. This systematic review was undertaken to determine the prevalence of PIVC infections and all-cause failure.

Methods

A systematic search was conducted on the 26th of August 2022 in the Cochrane Library, PubMed, CINAHL, and EMBASE for observational studies and randomised controlled trials (RCTs) that reported PIVC infections or failure. Studies published in English since the year 2000 were included. Pooled estimates were calculated with random-effects models. Meta-analysis of observation studies in epidemiology guidelines and the Cochrane process for RCTs were used to guide the review.

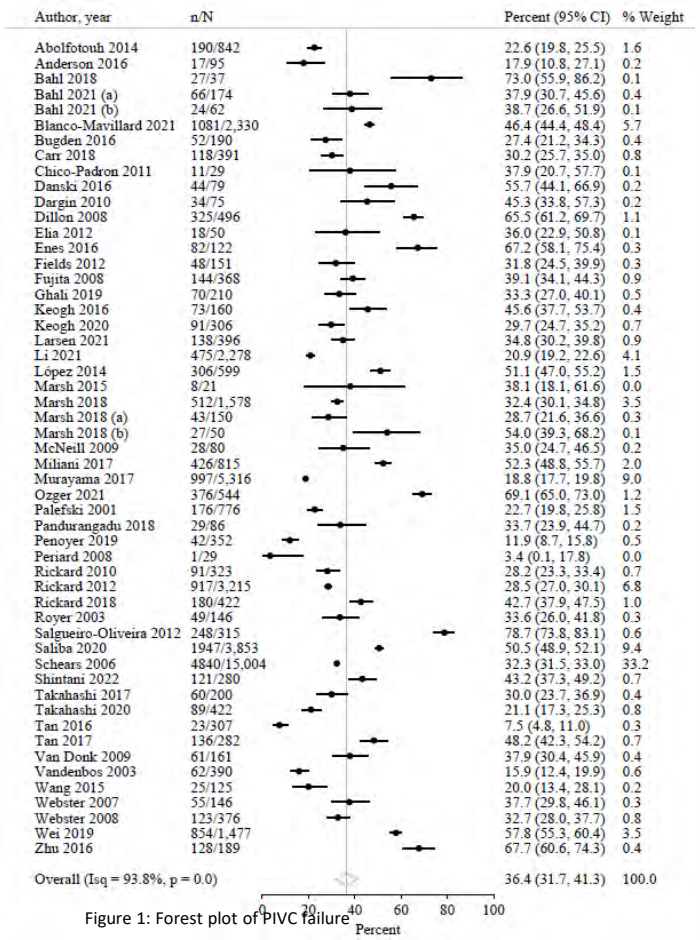

Figure 1: Forest plot of PIVC failure

Results

Database searches returned 34,725 studies, of these 41 observational and 28 RCTs were included (478,586 PIVCs). The pooled proportion of catheter-associated bloodstream infections (CABSI) was 0.028% (95% confidence interval (CI): 0.009–0.081; 38 studies), or 4.40 CABSI per 100,000 catheter-days (20 studies, 95% CI: 3.47–5.58). Local infection occurred in 0.150% PIVCs (95% CI: 0.047–0.479, 30 studies) with an incidence rate of 65.1 per 100,000 catheter-days (16 studies; 95% CI: 49.2–86.2). In total 36.4% of PIVCs failed (95% CI: 31.7–41.3, 53 studies) (Figure 1) with an incidence rate of 4.42 per 100 catheter days (78,891 catheter days; 19 studies; 95% CI: 4.27–4.57).

Conclusions

One in three PIVCs are failing globally and although PIVC infection occurrence is low, it remains a high burden with over 2 billion PIVCs purchased every year.

Safety and Efficacy of ERCP in Nonagenarians – A Retrospective Cohort Study

Authors: A. ETCHEGARAY,[1] S. MUDALIAR,[1] K. RYAN,[1] K. HAY,[2] J. HWANG,[1] B. DEVEREAUX,[1] M. APPLEYARD,[1] F. GRIMPEN.[1]

[1]Royal Brisbane and Women's Hospital, Brisbane, Australia [2]QIMR Berghofer Medical Research Institute, Brisbane, Australia

INTRODUCTION

- An increasing number of older patients with pancreaticobiliary disease are undergoing **Endoscopic Retrograde Cholangiopancreatography (ERCP).**[1]
- Older patients may be at higher risk of post-ERCP complications due to age, comorbidities, and delayed diagnosis.[2-6]
- Clinical success, adverse outcomes and survival after ERCP in this cohort has important implications for acute care planning, consent, and health service operation.
- Studies are required to evaluate **long-term safety and mortality** following ERCP in patients aged ≥90 years.

AIM

1. To evaluate **long-term clinical**, **procedural and safety outcomes in patients aged 90 years and older** who undergo ERCP.
2. To evaluate patient, procedural and post-operative factors that may predict failure, adverse outcome and mortality.
3. To improve our ability to assess risk, perform pre-procedure counselling, and deliver meaningful healthcare to elderly patients.

METHOD

- Retrospective cohort study of nonagenarians (aged ≥90 years) who underwent ERCP over 12 years (March 2011 – April 2023) at a tertiary referral hospital in Brisbane, Australia, following careful review of patient and disease factors.
- Data collected to **evaluate procedural success, adverse outcomes** and **mortality.**
- **Technical success** defined as successful cannulation of the bile duct.
- **Post-ERCP adverse outcomes** classified according to the ASGE consensus guidelines for endoscopic adverse events, within 30-day of the procedure.[7]
- Native ERCP defined according to the presence of a native papilla without previous sphincterotomy.
- Patients categorised into two groups based on indication: **benign** (choledocholithiasis with cholangitis, bile leak) and **malignant** (malignant biliary obstruction, MBO).
- Kaplan-Meier methods used to explore survival and Cox proportional hazard modelling to determine associations between survival and variables of interest.
- The significance threshold was prospectively set at p<0.05.

RESULTS

- 159 consecutive ERCPs were performed in 115 patients aged 90 years and older, with a steady increase in the number of ERCPs performed throughout the 12-year study period, Figure 1
- Mean age was 92.3 (SD±2.1); 77% patients were from regional or rural hospitals, Table 1
- Most common indications for ERCP included **choledocholithiasis with cholangitis** (n=125, 78.6%), **malignant biliary obstruction** (n=30, 18.9%), and **post-operative bile leak** (n=4, 2.5%).
- **Survival** was significantly reduced for MBO compared to benign pathology (**p<0.001**), Figure 2, Table 2
  - Overall **median survival** post ERCP was 37 months (95% CI 9.5-81); 3.7 (95% CI 1.1-8.3) months in MBO compared to 51 (95% CI 24-82) months in those with benign pathology.
  - **30-day survival** was 94%; 78% in MBO compared to 98% with benign pathology (**p=0.003**). 12-month survival was 73%; 9% in those with MBO and 89% in those with benign pathology (**p<0.001**), Figure 2
  - Increased risk of death with ASA category 4 compared to category 3 (HR: 2.5 (1-6.3) **p=0.018**).
- **Technical success** was achieved in 95% of native papilla ERCPs for benign pathology and 67% of first procedures for MBO; ERCP performed for malignant pathology was significantly more likely to fail (**p<0.001**), Table 1
  - Failure was due to technical difficulty (40%), patient-related (30%), and anatomy-related (30%) factors.
- **Adverse Outcomes** occurred in 5% procedures; most commonly cardiorespiratory (1.8%), bleeding (1.2%), and pancreatitis (0.6%), Table 1
- Indication was not predictive of adverse outcomes (p=0.46); **30-day mortality** following adverse outcome was 14.3% (n=1).

CONCLUSIONS

- **ERCP is a safe and effective intervention in selected nonagenarian patients.**
- Low peri-interventional mortality with 94% survival at 30-days.
- Clinically relevant **6-month survival of 30% in malignant biliary obstruction and 12-month survival of 89% in benign pathology**, with a success and adverse outcome rate comparable to the general population.
- These findings have implications for disease prognostication, including pre-operative acute care planning and consent, and ultimately our ability to offer meaningful therapeutic endoscopy to nonagenarians.
- **Age does not constitute a barrier to the performance of ERCP in patients aged 90 years and older when they are appropriately assessed and selected.**

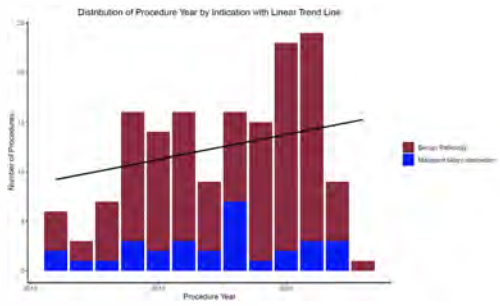

Figure 1: Total ERCP procedures performed in patients aged ≥90 years (per year) between March 2011 and April 2023, (n =159) with linear trend line.

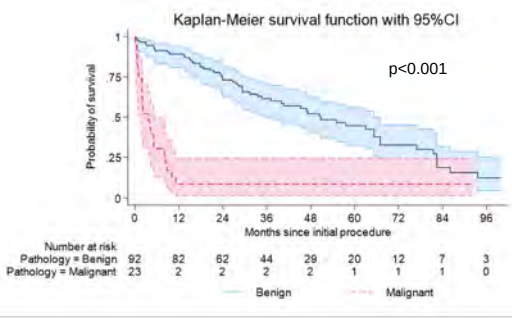

Figure 2: Comparison of Kaplan-Meier survivor functions by type of pathology in nonagenarians undergoing ERCP (n = 115), p=<0.001.

(A) Variable – per patient		Benign (n=92)	Malignant (n=23)	Total (n=115)	P-value
Gender[a]	Female	61 (66%)	14 (61%)	75 (65%)	0.62
	Male	31 (34%)	9 (39%)	40 (35%)	
Age[b]		92.5 (2.2)	91.9 (1.8)	92.3 (2.1)	0.28
Rural/regional[a]		70 (77%)	18 (75%)	88 (77%)	0.86
Charlson Comorbidity Index[b]		6.3 (2.1)	7.4 (2.1)	6.5 (2.2)	0.023
Duodenal Diverticulum[a]		40 (44%)	3 (13%)	43 (37%)	0.007
ASA[a]	2	11 (12%)	1 (4.3%)	12 (10%)	0.56
	3	63 (69%)	17 (74%)	80 (70%)	
	4	18 (20%)	5 (22%)	23 (20%)	
(B) Variable – per native papilla		**Benign (n=83)**	**Malignant (n=21)**	**Total (n = 104)**	**P-value**
Technical Success		95%	67%	90%	<0.001
(C) Variable – per procedure		**Benign (n=129)**	**Malignant (n=30)**	**Total (n = 159)**	**P-value**
Native papilla		83 (64%)	24 (80%)	107 (67%)	0.28
Stent		44 (34%)	20 (67%)	64 (40%)	0.0047
Adverse Outcomes		5 (4%)	3 (10%)	8 (5%)	0.46

Table 1: (A) Baseline patient characteristics by indication (n=115). [a]N (%) with P-value from Pearson's chi-square test; [b]Mean (SD) with P-value from independent t-test. **(B)** Baseline procedural characteristics by native ERCP (n=104) **(C)** Baseline procedural characteristics by indication, (n=159).

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We thank all the endoscopy staff for their hard work in facilitating the delivery of our advanced endoscopy service to both local and regional communities.

Harnessing venom-derived peptides to treat KCNH1 genetic epilepsies

Alexandra K. Sundman,[1,2] Lata Vadlamudi,[3,4] Ernst J. Wolvetang,[5] and Glenn F. King[1,2]

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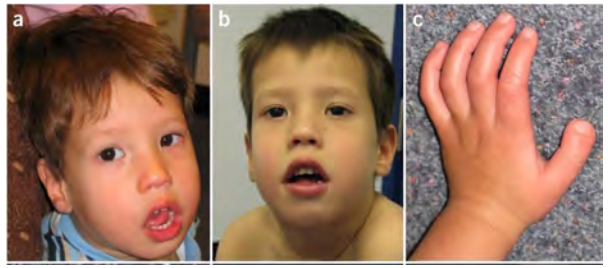
[3]UQ Centre for Clinical Research [4]Department of Neurology, Royal Brisbane and Women's Hospital
[5]Australian Institute for Bioengineering & Nanotechnology, UQ

CIPPS Centre for Innovations in Peptide and Protein Science — Australian Research Council Centre of Excellence

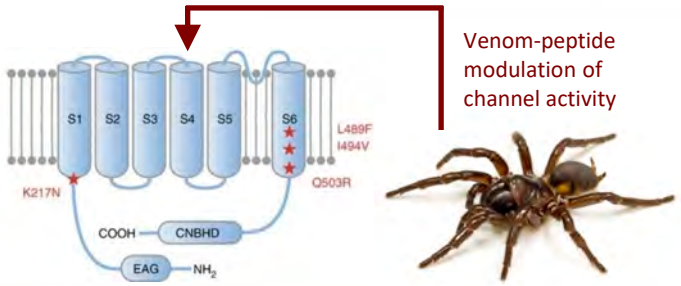
KCNH1 epilepsy

Gain-of-function mutations in KCNH1 (Kv10.1) that cause epilepsy & developmental defects

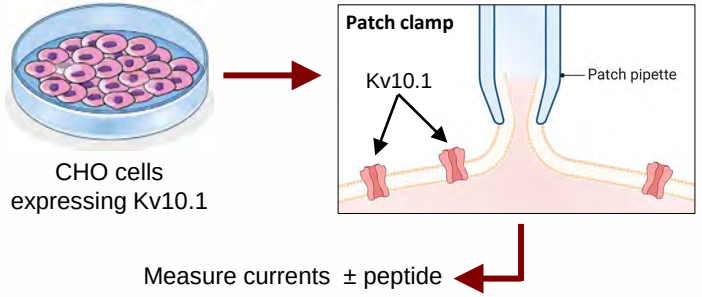


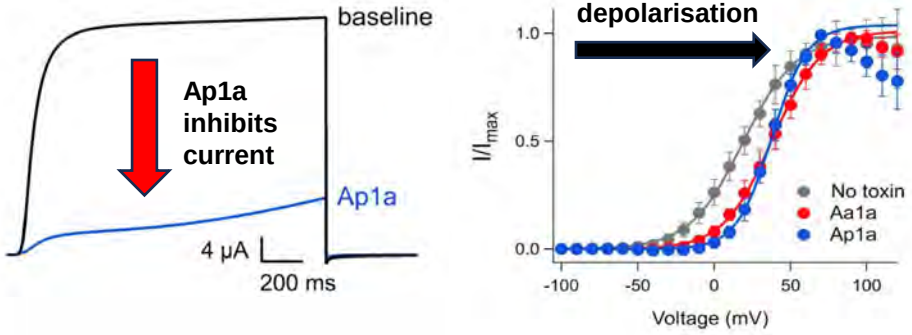
Why use spider venom?

- rich source of stable peptides that can potently & selectively modulate ion channels
- We have a library of >500 venoms



Whole-cell patch-clamp electrophysiology

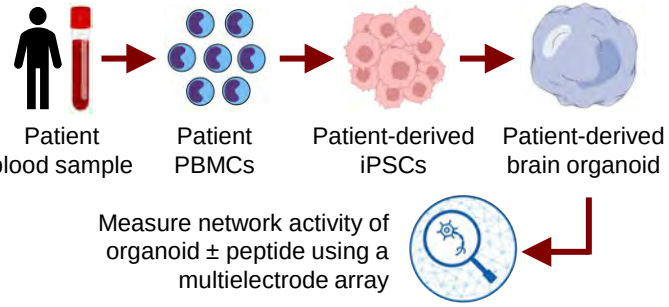




We have identified a peptide-drug candidate (Ap1a) that inhibits KCNH1 (Kv10.1) and are optimising peptide potency & selectivity

Patient-derived brain organoids

- PMBCs from patient blood samples turned into induced pluripotent stem cells (iPSCs)
- iPSCs grown into 3D neuronal cultures
- Multielectrode array (MEA) captures changes in electrical activity when peptide is administered



Challenges and future directions

- Off-target effects: the closely related channel hERG/Kv11.1 is vital for cardiac function
- Blood brain barrier (BBB) is difficult to breach
- Protein chemistry and structural biology will be required to fully understand mechanism

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

The use of indirect calorimetry in people with eating disorders. A scoping review

Michael Wilson[1,2], Carrie-Anne Lewis PhD[1,2], Adrienne Young PhD[1,2,3], Amanda Davis[4], Amy Hannigan[4], Kylie Matthews-Rensch PhD[1,2,5]

1) Dietetics & Foodservices, Royal Brisbane & Women's Hospital, Brisbane, Queensland, Australia. 2) Nutrition Research Collaborative, Royal Brisbane & Women's Hospital, Brisbane, Queensland, Australia. 3) Centre for Health Service Research, University of Queensland, Brisbane, Queensland, Australia. 4) Queensland Eating Disorder Service, Brisbane, Queensland, Australia. 5) Eating Disorders and Nutrition Research Group, Western Sydney University

Introduction

- Every year 55.5 million people globally experience eating disorders.
- Treatment for patients with medically compromised eating disorders usually involves hospital admission and provision of adequate nutrition via oral, enteral or parenteral nutrition.
- Indirect calorimetry (IC) analyses gas exchange and calculates resting energy expenditure (see figure 1). It is the gold standard for measuring energy expenditure to determine an individual's nutrition requirements, yet literature on its use in the target cohort is limited.

Methods

- PubMed®, Cochrane, CINAHL, and Medline were searched, to identify studies reporting use of IC in adult inpatients with medically compromised eating disorders.
- There were no restrictions on publication date or study type.
- All sexes and eating disorder types were accepted, studies not published in English were excluded.

Results

Selection of articles	• 641 screened at title abstract. • 128 assessed at full text. • 19 articles included in the final review, including one identified from citation searching.
Number of participants	n=634 with eating disorders, all diagnosed with anorexia nervosa (average BMI 13.2kg/m^2).
Fasting	Prior to IC measurements patients fasted for ≥10-12hours, and no adverse events regarding fasting were reported.
Timeline of IC measurements	Timelines of IC measurements during refeeding were variable, and it remains unclear the most efficacious time to perform IC if used to guide nutrition provision.
Mental health considerations	Reporting on co-occurring mental health diagnoses and complexities and considerations when using IC in patients with eating disorders was scarce.

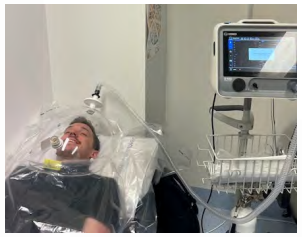


Figure 1: Indirect calorimetry device in use. Photo of primary author used with consent.

Discussion

- There is paucity of literature regarding practical considerations of using IC in adult patients with medically compromised eating disorders.
- IC has the potential to empower clinicians to better understand the nutritional needs of their patients and personalise nutrition prescription.
- Further research is required to inform the useful, sensitive, and robust use of IC in the target cohort.
- In the absence of routine use of IC, set nutrition provision protocols, set caloric targets or predictive equations remain more feasible options despite various pitfalls of these methods.

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

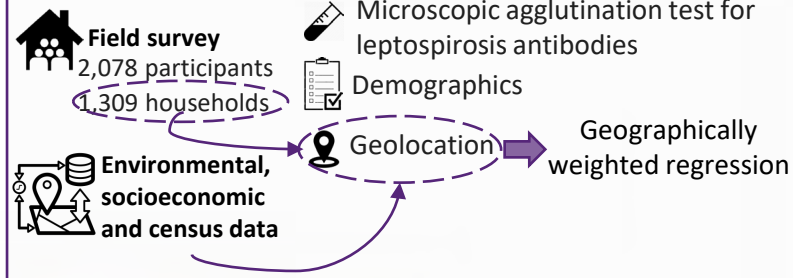
QUT Centre for Immunology and Infection Control | QIMR Berghofer Medical Research Institute THE FUTURE OF HEALTH | CSIRO Australian e-Health Research Centre | The University of Queensland AUSTRALIA CREATE CHANGE | HERSTON HEALTH PRECINCT | RBWH Foundation | QUT | Metro North Health | Queensland Government

Aim:

- To identify local **risk factors and drivers** of leptospirosis
- **Provide evidence** to support **more tailored local public health interventions**.

Methods:

Espaillat and San Pedro de Macoris - DR, 2021:



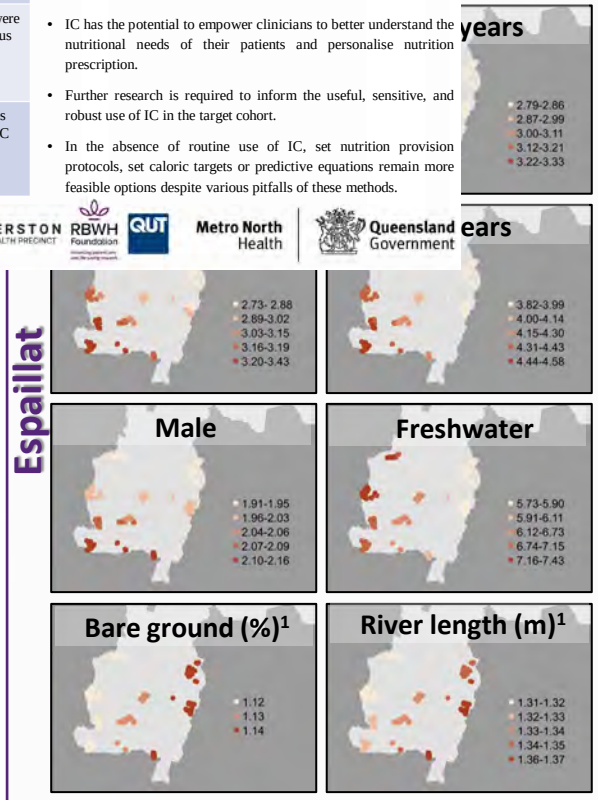
CDC | Brigham Health Brigham and Women's Hospital | London School of Hygiene & Tropical Medicine

graphic drivers of leptospirosis in the Dominican Republic
weighted regression

Jocelyn Then Paulino[3], Marie Caroline Etienne[3], Ronald Skewes-Ramm[3], Eric J. Nilles[4,5,6], Colleen L. Lau[1]

lic Health, The University of Queensland, Brisbane, QLD, Australia. 3- Ministry of Health, Santo Domingo, Dominican
anitarian Initiative, Cambridge, MA, USA

lence between the two provinces and in **risk factors**
tion of **province-specific models**



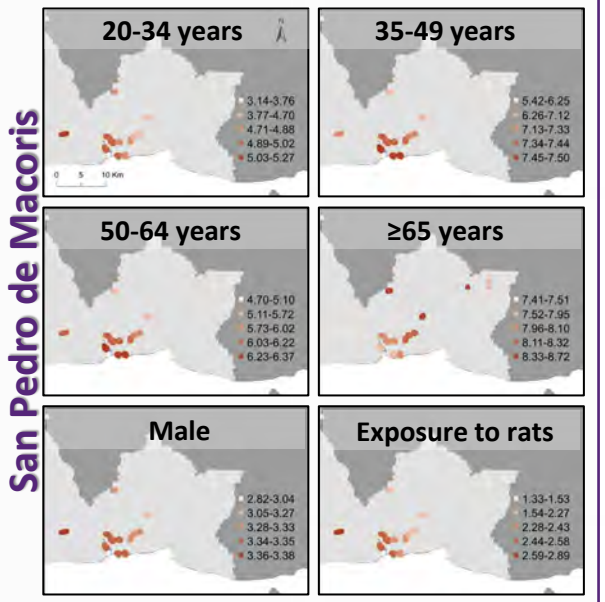


Figure 2: Spatial variation in odd ratios for leptospirosis seropositivity from geographically weighted regression, SPM.

Figure 1: Spatial variation in odd ratios for leptospirosis seropositivity from geographically weighted regression, Espaillat. [1]in a 250m buffer around the household.

Each dot represents a surveyed household, and colours represent OR at the household location for each covariate.

Conclusions:

- Identified **marked spatial variability** in the **relative importance** associated with risk factors and drivers **across** and **within** provinces.
- The **most important** contextual risk factors were **specific to each province** (i.e., positive exposure to freshwater in Espaillat and age group ≥65 years in SPM).
- These results **underscore t**he **importance of geospatial analyses** for guiding **tailored public health interventions**.

Acknowledgements:
We would like to thank the many study participants who volunteered to participate in this study. We would also like to thank the study staff who collected the field data, the Dominican Republic Ministry of Health and Social Assistance, and the Pedro Henriquez Ureña National University, for their commitment and support for the study. Finally, we would like to thank Dr Gregorio Antonio Rosario Michel and the valuable team working in the Servicio Geologico Nacional for providing the flooding-risk map.

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The use of indirect calorimetry in people with eating disorders. A scoping review

Michael Wilson[1,2], Carrie-Anne Lewis PhD[1,2], Adrienne Young PhD[1,2,3], Amanda Davis[4], Amy Hannigan[4], Kylie Matthews-Rensch PhD[1,2,5]

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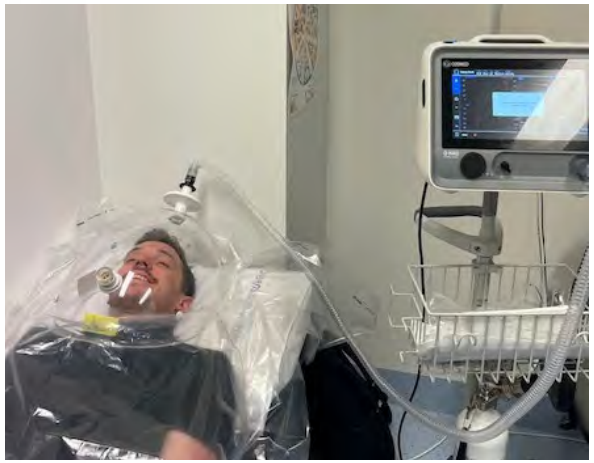

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Targeted sampling for lymphatic filariasis (LF) surveillance in Samoa

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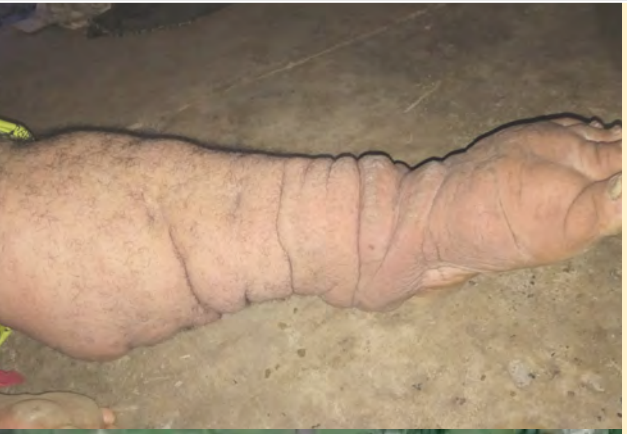

- LF is a **globally prevalent** mosquito-borne disease, which can cause irreversible **lymphedema (elephantiasis**) and disproportionality affects the world's poorest people.
- A challenge for surveillance is that **most infected people will never have symptoms**. Disease distribution is often clustered. To eliminate LF as a public health problem, **efficient surveillance strategies** are needed to find and treat as many infections as possible with limited resources.
- In 2023, we conducted a survey in Samoa and **compared LF antigen (Ag)** prevalence in a **random sample** of households to Ag prevalence in households living within 200 m of a household of a known infected case (**targeted sampling**).
- Relatively **more people were found in the targeted** compared to **random sample**, particularly in villages with medium Ag prevalence (Fig 1)
- In low and medium Ag prevalence settings, **targeted sampling** of houses neighbouring a known LF case is recommended as an **efficient strategy** to support LF elimination programs.

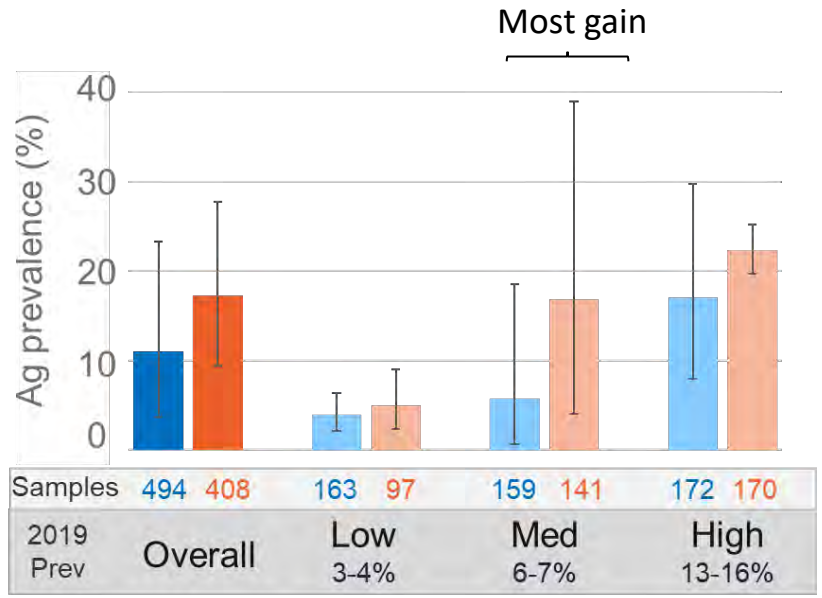

Fig 1. *Adjusted antigen prevalence in six villages in Samoa in 2023, analysed according to Ag prevalence category. Errors bars show 95% confidence intervals*

The University Of Queensland AUSTRALIA

ODeSI Operational Research and Decision Support for Infectious Diseases

Empowering patient autonomy: Implementing Food Service Orientation Workflows on long stay rehabilitation wards to promote person-centered nutrition care

By Eliza Fairlie[1], Hannah Olufson[1,2], Jessica Kinneally[1], Jennifer Ellick[1,2]
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[2]University of Queensland

Purpose:

The food service systems in the rehabilitation wards at The Surgical Treatment and Rehabilitation Service (STARS) were designed to promote **flexibility** and **person-centred care** through:

- Communal dining
- On-demand ordering (via app or bedside patient engagement systems)

However, **local research** identified a lack of awareness as a **barrier for patients**, **highlighting an opportunity** to enhance interprofessional communication.

Methods:

Workflows were created and piloted in the rehabilitation wards between **September to December** of 2023. During this period, Dietetic Assistants visited **patients upon admission** to the ward to familiarize them with:

Patients were followed up on consecutive days to **identify any barriers** to using these systems. Data for on-demand ordering, dining room attendance and feedback from patients and staff were collected.

Results:

Following implementation of the workflows, there was a noticeable **increase in dining room attendance**.

On-demand ordering rising in some wards from 34-58%. However, variations in using these systems appeared to stem from **inconsistencies** in the **messages delivered by staff**.

Feedback from staff noted that orientations lasted **>10mins with patients** requiring **additional sessions** and prompting.

Learnings and Future Practice:

This pilot study **highlighted the importance of routine orientation** of these local systems to empower patients to utilise available resources as part of their nutrition care journey.

Staff and patient feedback revealed **opportunities to streamline content delivery** and improve consistency.

As a result, future projects **utilizing videos** outlining the orientation have been created and will be **uploaded to the bedside** patient engagement systems for staff and patients.

"Sometimes the first orientation is difficult to complete with late admissions due to competing priorities."

SMOKING IN LOUISIANA: ASSESSING THE RELATIONSHIP BETWEEN UNEMPLOYMENT AND CIGARETTE USE

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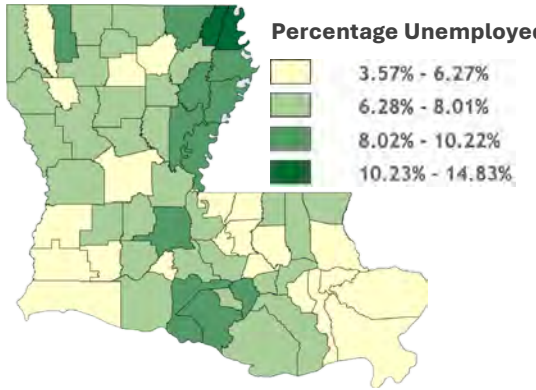
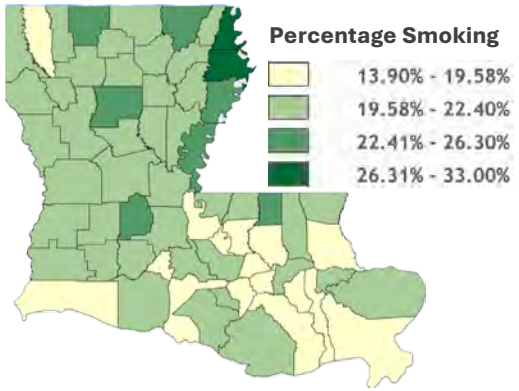
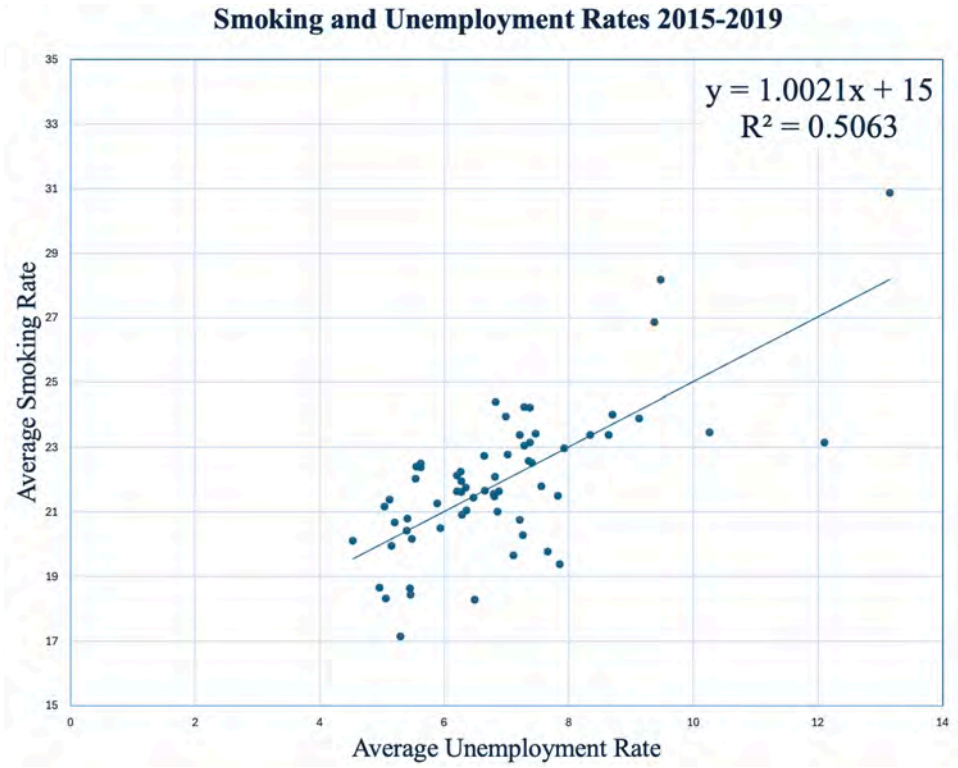
INTRODUCTION

According to 2019 CDC data, Louisiana has the fourth-highest adult smoking population in America. Previous studies have demonstrated that tobacco smoking is consistently associated with unemployment rates at a national level. This project aims to assess that relationship and determine if it holds in the state of Louisiana.







METHODS

The Louisiana Department of Health Data Explorer was utilized to select the annual unemployment rate and smoking prevalence from 2015 to 2019 in 64 parishes. Averages for both variables in each parish were calculated across that period of time. Subsequently, linear regression analysis was conducted to evaluate the correlation between unemployment and cigarette use.

RESULTS

The average unemployment rate from all parishes in all years was 6.9% and the average smoking prevalence rate from all parishes in all years was 21.91%. The results of this research indicate a statistically significant, moderately positive correlation between unemployment rates and smoking prevalence throughout Louisiana (R^2 = 0.5063 and $p < 0.05$).

CONCLUSION

The correlation between tobacco smoking and unemployment in Louisiana highlights disparities impacting residents' wellness. Further research is needed to establish causal relationships and confounding variables. Additional qualitative research can elucidate underlying mechanisms, while randomized controlled trials can evaluate interventions to reduce smoking prevalence and optimize public health initiatives in Louisiana.

EVIDENCE FOR INDWELLING URINARY CATHETER SECUREMENT IN ADULTS: A SCOPING REVIEW

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[1]The Prince Charles Hospital, [2]The University of Queensland, [3]Royal Brisbane and Women's Hospital, [4]Herston Infectious Diseases Institute Metro North Health

Purpose

To systematically identify and map evidence for indwelling urinary catheter securement use in adults in a healthcare setting.

Methods

Arksey & O'Malley's (2005) framework was used to conduct this scoping review. The Patterns, Advances, Gaps and Evidence for practice and Research recommendation (PAGER) framework was used to synthesize the review findings. Strength of recommendations (certainty of evidence) as per author(s) were provided for clinical practice guidelines. Electronic databases including PubMed, Cumulative Index to Nursing and Allied Health, Embase and the Cochrane Central Register of Controlled Trials and a targeted grey literature were completed (searches: February 2024). Protocol was registered on the Open Science Framework (https://doi.org/10.17605/OSF.IO/Y5AM).

Results

- Twenty-two articles were included, including seven research studies and 14 clinical practice guidelines.
- All studies (n=7) were quantitative, with sample sizes ranging from 30 to 751 participants, and three studies included >100 participants. Studies were specific to types of securement products, with adhesive devices (n=5, 71.4%) and tape (n=4, 57.1%) most frequently used.
- Most (n=10, 71.4%) *clinical practice guidelines* recommend IDC securement use to prevent catheter movement or urethral traction with strength of recommendations as per author(s) provided for six (42.9%) guidelines.
- Clinical practice guidelines (n=5, 35.7%) recommended *application to the upper thigh or abdomen (n=3, 60%),* and *gender-specific recommendations were provided (n=2, 40%), including the abdomen for males and the thigh for females.*
- The strength of the recommendations for securement location, as per the author(s), was provided in two guidelines (14.3%) based on low-quality evidence.

Conclusion

Securement products, including adhesive devices and tape, were used to secure catheters. This review highlights that further studies are needed to identify the most effective securement products and their optimal location and to strengthen clinical practice guideline recommendations.

For a full reference list or any inquiries, please contact: Jane.Wickins@health.qld.gov.au

Psychological Factors Predict Post Bariatric Surgery Outcomes for People with Type 2 Diabetes

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Background

Results from randomised controlled trials show bariatric surgery improves glycaemic control and weight loss outcomes in people with Type 2 diabetes and comorbid obesity[1,2]. Given the impact on quality of life, and the increasing utilisation of bariatric surgery, understanding the factors contributing to outcomes is increasingly important.

Objectives

To determine whether non-surgical variables, including psychological factors, predict bariatric surgery outcomes in people with Type 2 Diabetes.

Method

225 patients underwent bariatric surgery at a tertiary public hospital. Patients completed a battery of assessments at baseline (pre-surgery), and one month, three months, six months, and twelve months post-surgery. Anthropometric measures, psychometric and interview measures were collected.

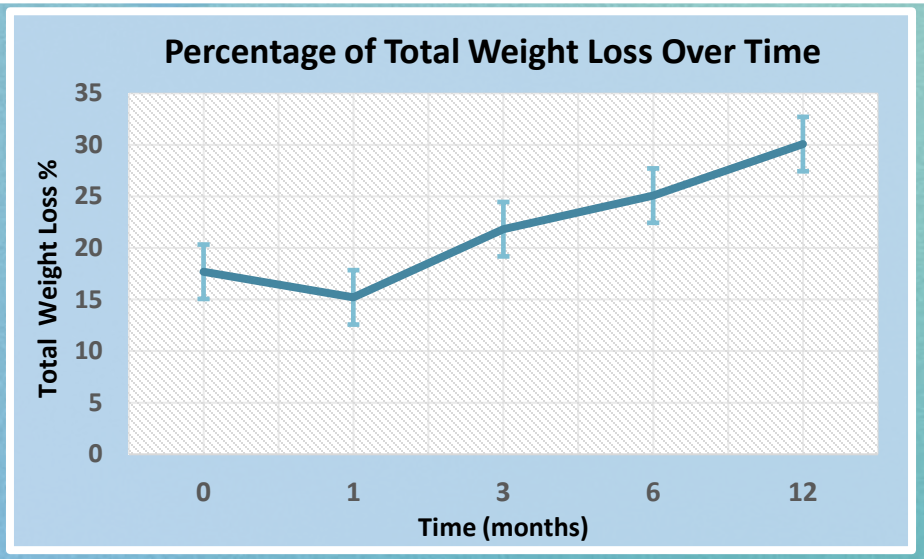

Figure 1. The weight change as a percentage of total weight loss during the follow-up period.

Predictors of Total Weight Loss Percentage

Model	Coefficient	95% CI	*p*
Time (months)	17.22	6.39, 28.04	0.007
Cognitive Restraint	0.65	0.38, 0.91	<.001
Childhood Trauma	-3.11	-6.13, -0.084	0.04
Sex (Male)	3.44	1.3, 5.57	0.002

Table 1
Predictors of Total Weight Loss Percentage (TWL%) Following Bariatric Surgery
Note. CI – confidence interval; No association was found for age, procedure type, emotional eating or depression.

Results

- A Generalised Estimating Equation (GEE) model was developed to determine predictors of weight loss outcomes.
- Cognitive restraint (an emotion regulation capacity involving a healthy control over food intake[3]) was positively associated with outcomes.
- Reported childhood trauma was negatively associated with weight loss.

Conclusion

Factors other than surgical technique, age and gender were relevant to outcomes in this sample. Cognitive restraint and reported childhood trauma were associated with weight loss outcomes. Further research is warranted to understand the nature of these associations.

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Is Tranexamic Acid Use Associated with Increased Risk of Venous Thromboembolic Events in Traumatic Abdominal Injury? A Systematic Narrative Review

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Introduction

Tranexamic acid (TXA) is an antifibrinolytic agent that has been shown to have a significant role in reducing bleeding rates across a variety of conditions including trauma-associated hemorrhage. Although TXA was discovered in 1962, widespread uptake did not occur until the 2010 CRASH-2 trial demonstrated that early treatment within the first three hours of injury significantly prevented death from bleeding (1).

Following global use in the trauma population, there is concern that TXA related thromboembolic effects may vary depending on the injury sustained, thereby necessitating further review to help guide this clinical intervention. In particular, the risks to individual abdominal trauma patterns from TXA administration is unknown.

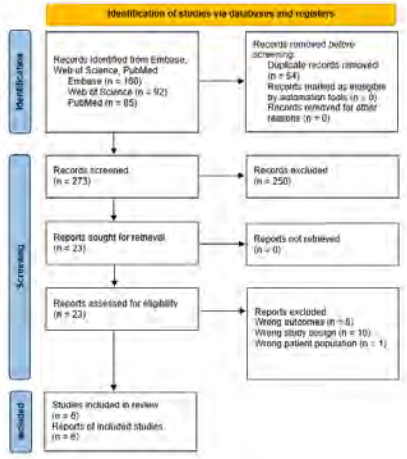
This systematic narrative review therefore aims to quantify the risk from TXA administration in traumatic abdominal injury by identifying rates of venous thromboembolic (VTE) complications.

Methods

Databases used:
PubMed, Embase, Web of Science

Search terms used:
("Deep Vein Thromb*" OR "Deep Venous Thromb*" OR "Pulmonary Embolism" OR "Pulmonary Thromboembolism" OR "PE" OR "DVT") AND ("Injur*" OR "Trauma" OR "Wound") AND ("Tranexamic Acid" OR "TXA")

Studies were included if they:
1) Reported rates of VTE, PE, or DVT after administration of TXA in abdominal trauma
2) Were written in English



PRISMA flow diagram

Lead Author	Year	Journal	Country	Study Design	Start Date	End Date	Population Description	Total Number of Participants	Subset Who Received TXA
Robert M. Van Haren	2014	The Journal of Trauma and Acute Care Surgery	USA	Prospective Cohort Study	August 2011	March 2013	Trauma patients who survived to the ICU with Greenfield's risk assessment profile (RAP) for VTE ≥ 10	121	27
John A. Harvin	2015	The Journal of Trauma and Acute Care Surgery	USA	Retrospective Cohort Study	September 2009	September 2013	Trauma patients aged 16 or older admitted with evidence of hyperfibrinolysis	1032	98
Ayman El-Menyar	2020	American Journal of Emergency Medicine	Qatar	Restrospective Cohort Study	January 2017	September 2018	Trauma patients aged 16 to 80 years old admitted to a level 1 trauma center	204	102
Kathleen E. Adair	2020	Trauma Surgery and Acute Care Open	USA	Retrospective Cohort Study	January 2009	December 2014	Military trauma patients from the Department of Defense Trauma Registry with an injury severity score (ISS) > 10 and a massive transfusion (MT)	859	318
Karlijn J. P. van Wessem	2021	World Journal of Surgery	Netherlands	Prospective Cohort Study	November 2013	November 2020	Adult polytrauma patients admitted to the ICU of a level 1 trauma center	422	280
Lisa Marie Knowlton	2023	International Journal of the Care of the Injured	USA	Prospective Cohort Study	January 2018	December 2020	Trauma patients aged 18 to 40 years old admitted for at least 48 hours with a minimum of 1 VTE risk factor	7331	466

Figure 1 - Demographics

Figure 2.1 - Median ISS Score by Study

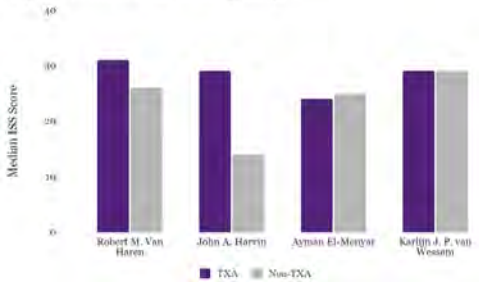


Figure 2.2 - Blunt MOI, % by Study

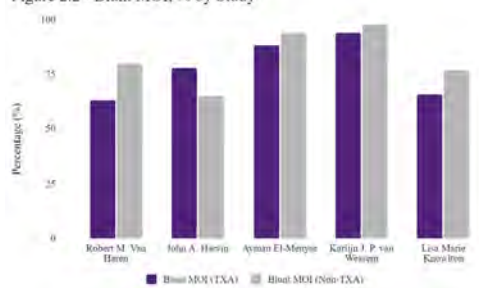
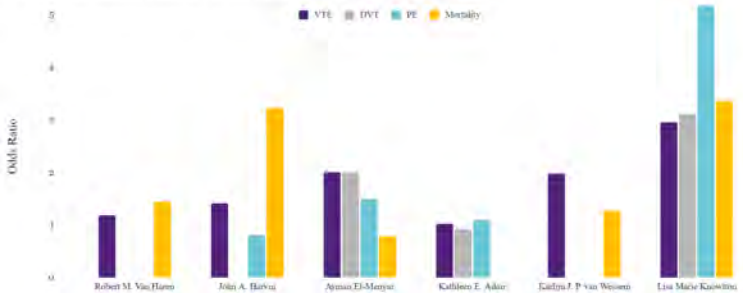


Figure 3 - Odds Ratio of Effects of TXA on Thromboembolic Rates and Mortality



*Adair et al. reported median ISS score and blunt MOI without approximations for a TXA missing group so it was not included.
*Knowlton et al. did not report median ISS and instead reported number of patients with ISS score < 16 or ≥ 16.

Results

The initial search identified 23 studies, of which 6 met inclusion criteria. Full-text screening of the 6 studies resulted in 5 studies being included as they reported the variables of interest (abdominal AIS score and VTE rates in patients who did and did not receive TXA).

Only one study reported a statistical difference in VTE rates between TXA patients and non-TXA patients who had primary abdominal injury. This prospective multicenter analysis reported the incidence rate for developing any VTE after TXA in patients with individual abdominal injury as 19% compared to 6% in non-TXA patients (2).

Discussion

TXA has been shown to have a significant role in preventing bleeding in trauma patients.

VTE rates may differ based on the injured abdominal organ, however, there is limited research to quantify this risk. Only one study directly compared VTE risk post TXA administration in individual abdominal organ injury.

At present the available literature does not inform clinical risk associated with TXA administration comparing individual solid abdominal organ injuries.

Future research on TXA use in trauma should report incidence of VTE by primary organ system injured.

Acknowledgement

This study is supported by the Jamieson Trauma Institute and the Royal Brisbane and Women's Hospital Trauma Service.

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PK/PD TARGET ATTAINMENT WITH CONTEMPORARY DOSING OF ANTIFUNGAL DRUGS. OUTCOMES FROM AN INTERNATIONAL, MULTICENTRE PHARMACOKINETIC STUDY FOR SCREENING ANTIFUNGAL EXPOSURE IN INTENSIVE CARE UNITS: THE SAFE-ICU STUDY

JA Roberts [a,b,c,1], F Sime [1], J Lipman [1,2], **MP Hernández Mitre** [a,1], JP Baptista [3], RJ Brüggemann [4], J Darvall [1], JJ De Waele [5], G Dimopoulos [6], JY Lefrant [2], MB Mat Nor [7], J Rello [2,8], L Seoane [9], MA. Slavin [1], M Valkonen [10], M Venditti [11], WT Wong [12], M Zeitlinger [13], C Roger [2]

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[1] Australia; [2] France; [3] Portugal; [4] Netherlands; [5] Belgium; [6] Greece; [7] Malaysia; [8] Spain; [9] USA; [10] Finland; [11] Italy; [12] Hong Kong; [13] Austria.

INTRODUCTION: Appropriate antifungal therapy is a determinant of survival of critically ill patients with susceptible fungal infections. **We sought to describe whether contemporary dosing of antifungals achieve therapeutic exposures in critically ill patients.**

METHODS: Critically ill adults prescribed fluconazole, voriconazole, posaconazole, isavuconazole, caspofungin, anidulafungin, micafungin or amphotericin B for treatment or prophylaxis of invasive fungal disease were enrolled. **Three blood samples were collected** (30 min post-completion of IV infusion, between 3–6 h after the start of drug infusion, and within 30 min preceding the next dose) **during a dosing interval on two occasions: between days 1–3** (occ1) **and between days 4–7** (occ2) **of antifungal regimen**.

- PK parameters (AUC_{0-24}, Cmax, and Cmin) were estimated by noncompartmental analysis.
- Predefined PK/PD targets were used to assess attainment; EUCAST ECOFFs were used where a MIC was not available.
- The highest MIC for a susceptible pathogen to the antifungal was assumed.

RESULTS: 339 patients **(30 ICUs/12 countries)** were included (61% male; median [IQR] age: 62 y [51–70]; BMI: 26.6 kg/m^2 [23.1–30.9]; SOFA score: 7 [4–11]).

- Antifungal therapy was primarily prescribed for treatment (80.8%).
- Fungi were identified in 47.5% of patients; only 26% had an MIC available.
- Nine patients received a second antifungal, and one a third antifungal; thus, 349 antifungal regimens were evaluated: 346 (99.1%) sampled on occ1 (30.1% commenced in the 24 h before the first sample collection); only 233 (68.8%) regimens were sampled on occ2.
- **Target attainment could not be determined for 46 courses** (7.9%, 19 on occ1 and 27 on occ2) **due to insufficient sampling**.
- Target attainment was higher for patients receiving prophylaxis (Table 1).
- **Low target attainment** was noted for **voriconazole**, **posaconazole**, **micafungin**, and **amphotericin B** (Table 1).

CONCLUSION: FURTHER RESEARCH AND **ADJUSTMENTS TO** CONTEMPORARY **DOSING PRACTICES SHOULD BE PERFORMED** TO OPTIMISE ANTIFUNGAL THERAPY IN THE CRITICAL CARE SETTING.

REFERENCES: [a]DOI: 10.1007/s00134-020-06050-1; [b]DOI: 10.1128/AAC.00585-18; [c]DOI: 10.1093/jac/dkz188; [d]DOI: 10.1128/AAC.01584-09; [e]DOI: 10.1128/AAC.01477-16; [f]DOI: 10.1016/j.cmi.2020.05.037.

Table 1. Antifungal data for PK/PD target attainment in critically ill patients

Antifungal agent	PK/PD target	Courses	Daily dose Median (min–max)	Target attainment Occasion 1 (n= 327)	Target attainment Occasion 2 (n= 206)
Fluconazole 213 courses	**Treatment** [a] AUC_{0-24}/MIC ≥ 100	177	400 mg (100–1200) 5.0 mg/kg (0.8–17.5)	**80.7% (88/109)**	**89.7% (61/68)**
	Prophylaxis * AUC_{0-24}/MIC ≥ 55	36	400 mg (200–400) 3.8 mg/kg (1.9–7.4)	**91.3% (21/23)**	**92.3% (12/13)**
Voriconazole 40 courses	**Treatment** [a] Cmin ≥ 2–6 mg/L	33	280 mg (100–410) ** 3.9 mg/kg (1.8–6.0) **	**52.9% (9/17)**	**37.5% (6/16)**
	Prophylaxis Cmin ≥ 1–6 mg/L	7	200 mg (150–300) ** 2.4 mg/kg (2.4–4.7) **	**75% (3/4)**	**100% (3/3)**
Posaconazole 22 courses	**Treatment** [a] Cmin > 1 mg/L	9	300 (300–600) 4.7 mg/kg (2.5–9.6)	**37.5% (3/8)**	**0% (0/1)**
	Prophylaxis [a] Cmin > 0.5 mg/L	13	300 (300–600) 4.8 mg/kg (2.6–11.7)	**81.8% (9/11)**	**100% (2/2)**
Isavuconazole 10 courses	**Treatment** [b,c] Cmin between 1–5.13 mg/L	8	200 mg (200–1116) 2.8 mg/kg (1.8–15)	**60% (3/5)**	**100% (3/3)**
	Prophylaxis *** Cmin between 1–5.13 mg/L	2	400 mg (200–600) 4.9 mg/kg (2.5–7.4)	**0% (0/1)**	**100% (1/1)**
Anidulafungin 76 courses	**Treatment against *Candida albicans*** [d] $fAUC_{0-24}$/MIC > 20.6 ***against Candida glabrata*** [d] $fAUC_{0-24}$/MIC > 7.0 ***against Candida parapsilosis*** [d] $fAUC_{0-24}$/MIC > 7.6	66	100 mg (100–200) 1.4 mg/kg (0.6–3.1)	**78.4% (29/37)**	**79.3% (23/29)**
	Prophylaxis *** $fAUC_{0-24}$/MIC > 20.6	10	100 mg (100–200) 1.5 mg/kg (1.2–3.6)	**83.3% (5/6)**	**75% (3/4)**
Caspofungin 65 courses	**Treatment against *Candida albicans*** [d] AUC_{0-24}/MIC > 865 **against *Candida glabrata*** [d] AUC_{0-24}/MIC > 450 **against *Candida parapsilosis*** [d] AUC_{0-24}/MIC > 1185	51	50 mg (50–70) 0.7 mg/kg (0.4–1.0)	**90.9% (30/33)**	**83.3% (15/18)**
	Prophylaxis *** AUC_{0-24}/MIC > 865	14	70 mg (35–70) 0.7 mg/kg (0.6–0.9)	**88.9% (8/9)**	**80% (4/5)**
Micafungin 64 courses	**Treatment against *Candida sp*** [a] AUC_{0-24}/MIC > 3000 **against *Candida parapsilosis*** [a] AUC_{0-24}/MIC > 285	49	100 mg (100–100) 1.4 mg/kg (0.9–2.4)	**67.7% (21/31)**	**72.2% (13/18)**
	Prophylaxis *** AUC_{0-24}/MIC > 3000	15	100 mg (100–100) 1.1 mg/kg (0.8–1.8)	**50% (4/8)**	**42.9% (3/7)**
L-Amphotericin B 41 courses	**Treatment** [e] Cmax/MIC ≥ 25	41	250 mg (150–500) 3.3 mg/kg (1.9–6.5)	**41.7% (10/24)**	**58.8% (10/17)**
D-Amphotericin B 2 courses	**Treatment** [f] Cmax/MIC ≥ 4.5	2	22.5 mg (10–35) 0.5 mg/kg (0.2–0.7)	**0% (0/1)**	**0% (0/1)**

* Lower limit of the treatment range; ** Twice-daily dosing; *** Not defined, treatment target used; AUC_{0-24}, area under the plasma concentration-time curve from zero to 24 h; MIC, minimum inhibitory concentration; Cmin, minimum observed plasma concentration; Cmax, maximum observed plasma concentration; L-Amphotericin B, liposomal amphotericin B; D-Amphotericin B; amphotericin B deoxycholate. **Color code**: **≥80%**, **79-50%**, and **<50%**, not based on statistical tests.

Examining the Relationship Between Food Estimate Index and Obesity Prevalence in Louisiana

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Introduction

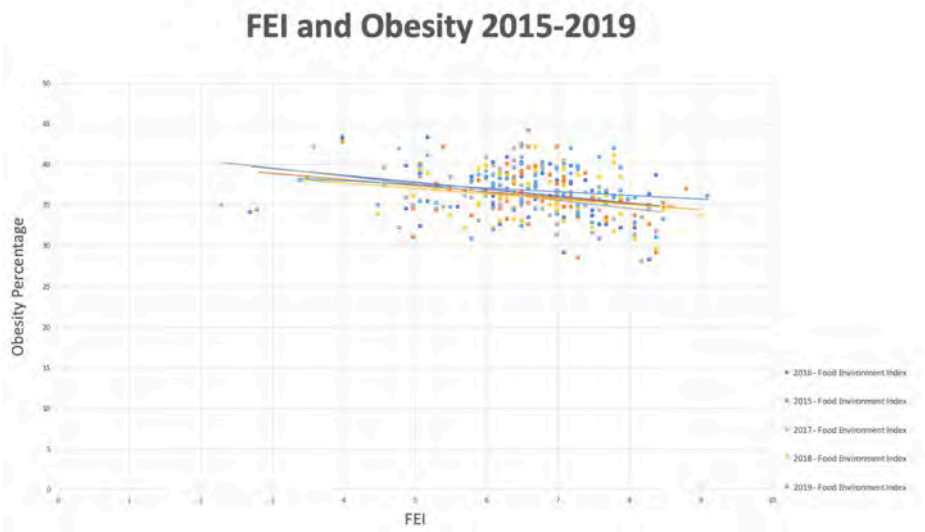
Food insecurity affects nearly 1 in 7 people in Louisiana. Statewide research on the food environment and obesity prevalence is limited. A common method to quantify access to nutritious food is with the Food Environment Index. This study aims to investigate the relationship between the FEI and obesity prevalence.

Methods

Louisiana Department of Health Data Explorer was utilized to select FEI (FEI, where 0 = worst; 10 = best) and obesity metrics in 64 parishes from 2015 to 2019. Linear analysis was performed to assess the strength of the relationship between FEI and obesity prevalence with R^2 and P values.

Figures

Year	R2	R	SampleSize	t-score	p-value
2015	0.0749	0.273678644	64	2.24048692	0.02865208
2016	0.0873	0.295465734	64	2.43522415	0.01777249
2017	0.1436	0.378945906	64	3.22429474	0.00201601
2018	0.0555	0.23558438	64	1.90871618	0.0609304
2019	0.0247	0.157162336	64	1.25306964	0.21488565



Results

Trends in 2015-2017 (2015: R2=0.0749, p = 0.02865; 2016: R2=0.0873, p=0.0178; 2017: R2=0.1436, p = .0020) showed a weak to moderate negative correlation between FEI and obesity prevalence, while 2018 and 2019 (2018: R2=0.0555, p=0.0609; 2019: R2=0.0247, p=0.2149) showed no statistical significance.

Morehouse parish was identified in the highest obesity grouping and the lowest FEI grouping in Louisiana (Percent Obese = 41%, FEI =5.2). Concomitantly, two parishes in the lowest obesity category had the highest FEI grouping (Livingston: Percent Obese = 31%, FEI = 8.5; St. Tammany: Percent Obese = 30.8%, FEI = 8.4). Large variability in FEI scores were noted from 3.4 to 9.1 while obesity only ranged from 30.6% to 43.9%.

Conclusion

While Morehouse, Livingston, and St. Tammany parishes align with expectations, the overall trend lacks significance in 2018 and 2019. As obesity rates vary less than FEI scores in Louisiana, anthropogenic factors and environmental rewards may exert greater influence, warranting investigation in future studies.

Implementation and evaluation of the Medication Administration Evaluation and Feedback Tool: lessons learned

Karen Davies[1,2,3], Peter Donovan[2,3], Samantha Keogh[2,4], Jed Duff[2,4], Dale Trevor[5], Fanuel Garayi[6], Michelle Crawford[6], Shannaen Gilbert[6], Leena Prasad[6], Ian Coombes[2,3]

[1] Herston Infectious Disease Institute, [2] Royal Brisbane and Women's Hospital, [3] University of Queensland, [4] Queensland University of Technology, [5] Consumer Representative, [6] Brighton Health Campus

MAEFT Implementation

PURPOSE
Evaluate the **implementation** of the **MAEFT**
- **Brighton** Health Campus & **IMES** RBWH MNHHS

METHOD
Hybrid II effectiveness-implementation quasi-experimental **pre/post design**

RESULTS
Developed:
- MAEFT **online** Microsoft Forms
- Education in MN Talent Management System (**TMS**)

RESULTS cont…
- Accessible
- Efficient
- Monitoring results

LESSONS LEARNED ENABLERS
- **Funding** for local facilitation
- Local **leadership** involvement
- TMS **education** modules
- **Feedback** positive **Encouraged** others to **participate**

LESSONS LEARNED BARRIERS
- **Conflicting** priorities
- Clinical **workload**
- **Roster** schedules
- **CONSENT** prior to MAEFT education

CONCLUSION
- **Feasible** if consent obtained post-education
- All feedback was **positive experience**
- Improved individual **accountability**
- Lead to **a culture change**

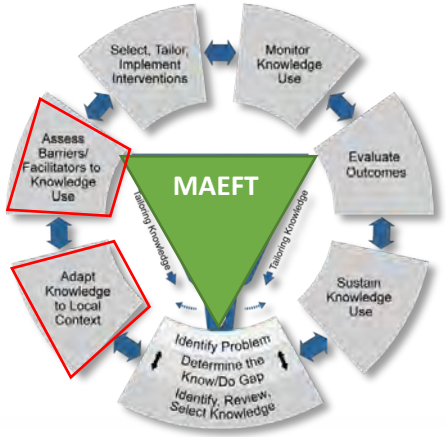


Figure 1: The Knowledge-to-Action Framework

Funding acknowledgements:
- QH Clinical Research Fellowship Grant 2023
- HeIDI Research Fellowship 2022-2025
- MNHHS SWIFT Grant 2023
- COH Kickstarter Implementation Grant 2023-2024

For further information contact:
karen.davies@health.qld.gov.au

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

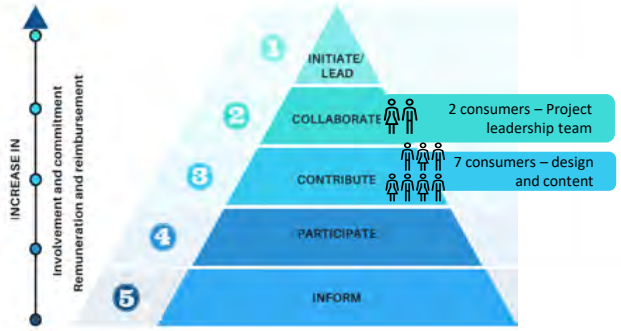
Meaningful Consumer Engagement in Medical Radiation Sciences: Enhancing Quality Improvement and Research Projects

Amy Brown,[1,2] Brianna McCoola,[3] Yovanna Funnell,[3] Catriona Hargrave[2,4]

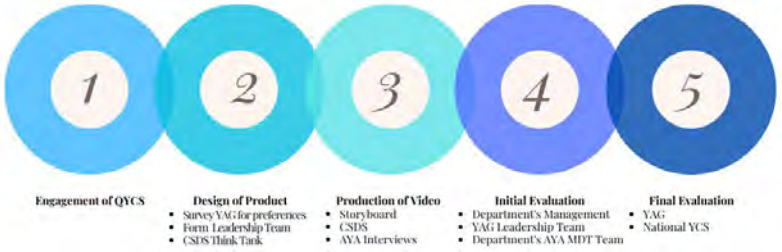
1 Townsville Cancer Centre, Townsville University Hospital, Townsville, Queensland, Australia
2 Queensland University of Technology, Faculty of Health, School of Clinical Sciences, Brisbane, Queensland, Australia
3 Department of Radiation Oncology, Royal Brisbane and Women's Hospital (RBWH), Herston, Queensland, Australia
4 Radiation Oncology Princess Alexandra Hospital – Raymond Terrace Campus, Brisbane, Queensland, Australia

CASE STUDY 1
Quality Improvement Project

Harnessing the power of consumer co-design to create multimedia patient education resources for AYA patients who require radiation therapy



Adapted from: National Framework for Consumer Involvement in Cancer Control & NHMRC Guidelines for Consumer Involvement



Consumer Impact

"I did not find radiation therapy easy but being a part of this project has been cathartic and empowering for me"
Lauren – 24, Medulloblastoma

"This project has been very inclusive and I am impressed with the quality of what we have produced"
Josh – 24, Lymphoma

Read our publication

WHY CONSIDER IT?

Reported Benefits [1-3]	Reported Challenges [4-8]
- Greater awareness of service from a lived expertise perspective - Meet community priorities - Relatability & understanding for our patients and stakeholders - Enrolment and retention - Empowerment and sense of value	- Lack of skills/resources/time - Lack of institutional guidelines - Potential "tokenistic" involvement / lack of understanding by HPs - Power imbalances/ paternalism - Risk and management concerns - Funding barriers

REFLECTIONS & LEARNINGS

Clear Guidelines & Support for Everyone
- Professionals to liaise with consumer engagement representative
- Gather information from consumer reference guides
- Early consultation with organisation ethics and governance
- Training or upskilling for consumers

Time and renumeration / funding
- Time investment is significant for consumers
- Missing opportunities for further consumer engagement regarding publishing due to lack of specific funding
- Professionals to investigate all avenues to secure renumeration

Unique consumer considerations
- Privacy and confidentiality
- Potential power imbalances / Peer Support

CASE STUDY 2
Research Project

Men's preference for image-guidance in prostate radiation therapy: A discrete choice experiment

Adapted from: National Framework for Consumer Involvement in Cancer Control & NHMRC Guidelines for Consumer Involvement

Consult with Ethics, Governance & THHS Person-Centred Care Lead	THHS SERTA Funding: •Parking •Conference Costs	Letter of Invite *5 previous patients who underwent PCa radiation therapy*	Meeting: expectations *(both parties)* + overview of project and team	Ongoing research team meetings	Ongoing Collaboration throughout project including co-content analysis	Co-author on 2 papers *Pre-recorded video co-presentation at conferences*

Consumer Impact

"It allowed me to voice my feelings as a layperson and it may make it better for other future patients"
Lux – Consumer Investigator

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HERSTON HEALTH PRECINCT SYMPOSIUM 2024

The Shift Change Project: An Implementation Pilot

Tatjana Monsch[1], Cindy James[1], Ben Hackwood[1]
The STARS Facility, Metro North Health

Introduction

A project plan was developed to change shift times to increase nursing handover between shifts..

The project aimed to reduce a large amount of overtime and improve staff work-life balance. This abstract reports on the 12-month evaluation.

Reduce Unplanned Overtime & Save Labor Budget (asappayroll.com)

Chart 1: Overtime

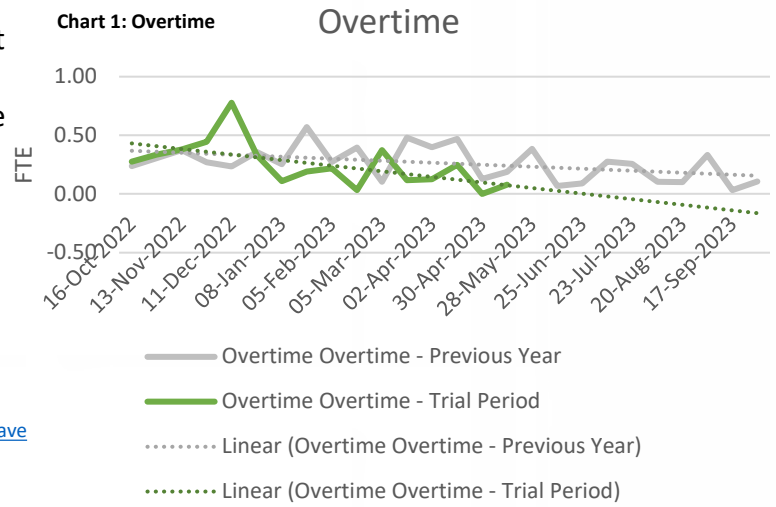
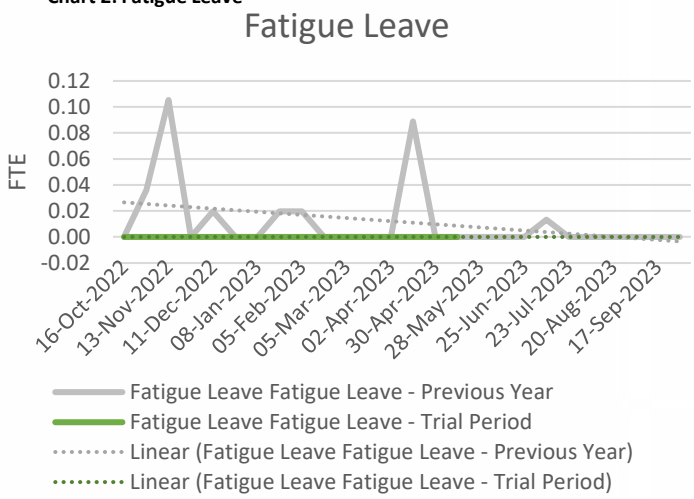


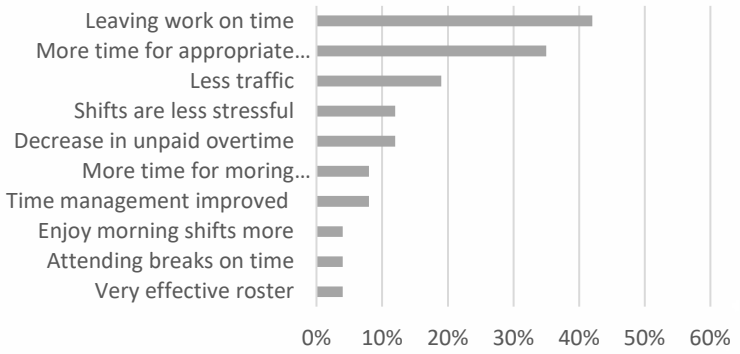
Chart 2: Fatigue Leave



Methods

This was a workforce project using implementation practice approaches. A literature review was completed on nursing handover, including staff and patient satisfaction. The shift change design was established with nursing teams, using guidance from leadership that had previously undertaken similar work and executed into daily workforce activity. A logic model was developed for implementation and evaluation processes. Pre-post surveys were conducted inviting staff by email. Staff was encouraged to provide feedback. Period of consultation with employees completed through ward meetings and opportunities for one-on-one conversations. Implementation processes included changes to the roster and pilot implementation on one ward at first.

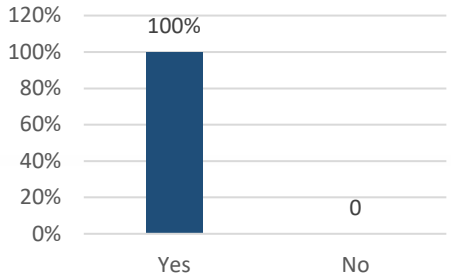
Chart 3: In your opinion, what are the positive aspects of the change in shift times trial to you personally?



Results

The shift change project ran over 6 months. Key stakeholders included Rehabilitation Services Nursing staff, STARS Executive Members, and relevant nursing union representatives. Both qualitative and quantitative data were used to evaluate the trial. Of 40 (100%) staff members 39 staff voted in support of trial implementation. The post-evaluation survey revealed that 29 (100%) staff members would like to continue the shift time change on the ward. However, sometimes it is “hard to replace staff due to other wards in the hospital having different commencement times”. An increase in handover duration resulted in less overtime. An average rating of 4.66 (24 staff) out of 5 (29 staff) report that the trial had a positive impact on the ward.

Chart 4: Q. I would like the change in shift times to continue in my ward.



7 Signs You May Need to Quit Nursing - BOS Medical Staffing

Conclusion

The pilot of The Shift Change Project was successful. It reduced overtime and improved the satisfaction of staff. Further scale-up is warranted.

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

Reducing Jargon: The use of large language models in adapting research on Systemic Lupus Erythematosus

Thomas Mundy[1], Maria Turcanu[1], Karmveer Kaur[1], Ravi Chachad[1]

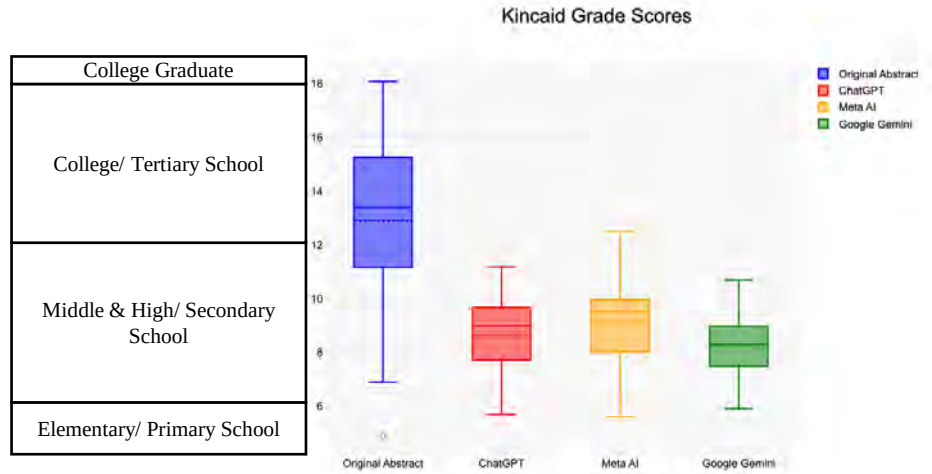
1. University of Queensland - Ochsner Clinical School

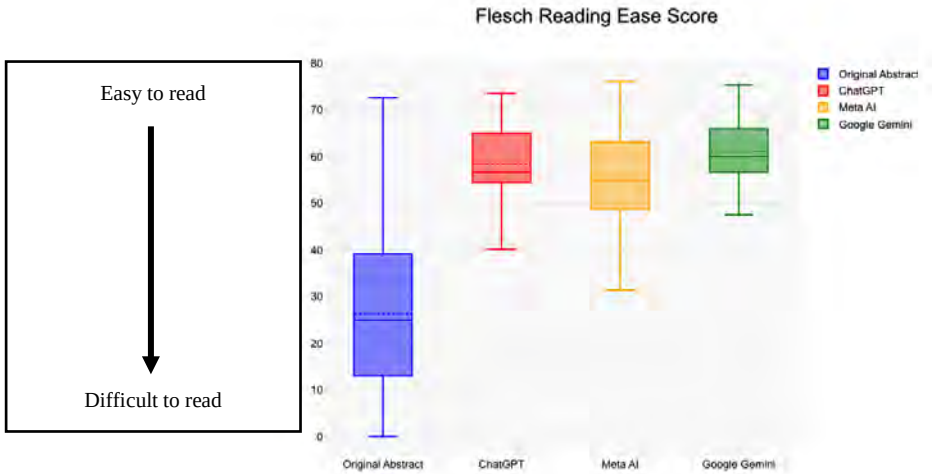
Purpose

Systemic Lupus Erythematosus (SLE) is a multi-system medical condition that can present with a broad constellation of symptoms. There continues to be a large influx of new research done to provide more information on the condition, how to treat, and to update guidelines. With increasing access to research articles to the public, it is not uncommon nowadays for patients to do their own research regarding their condition. The purpose of this study was to evaluate the ability of Large Language Models (LLM) to simplify research articles to enhance readability for an average reader.

Methods

Papers from the SLE section of *Arthritis & Rheumatology* starting from January 2023 were selected. ChatGPT, Meta AI, and Google Gemini used the same prompt to rewrite the abstract of each paper so that an average reader could understand it. Flesch-Kincaid grade-level and ease scores were calculated for the original abstracts as well as the outputs from the LLMs for statistical analysis.





Results

The Flesch-Kincaid grade-level scores of the original abstracts were 13.0 compared to 8.6, 9.2, and 8.2 and ease scores of the original abstracts were 25.9 compared to 58.5, 54.8, and 61.3 for ChatGPT, Meta AI and Google Gemini respectively ($p<0.05$).

Discussion

The research indicates that the LLMs were able to reduce the average grade-level to near 8th-grade level and improve the readability of the abstracts. Future research will focus on including further papers as more volumes of the journal are released and analyzing the content of the responses to assess accuracy and quality of the outputs.

Inhaled ceftriaxone-loaded liposomal nanoparticles for lower respiratory tract infections

Vijay Kumar Panthi [a], Kathryn E. Fairfull-Smith [b], Timothy James Wells [c], Nazrul Islam [a *]

[a] Pharmacy Discipline, School of Clinical Sciences, Queensland University of Technology (QUT), Brisbane, QLD, Australia

[b] School of Chemistry and Physics, Faculty of Science, Queensland University of Technology, Brisbane, Queensland, 4001, Australia.

[c] Frazer Institute, Faculty of Medicine, The University of Queensland, Brisbane, Australia.

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Objectives

Ceftriaxone (CTX) belongs to the category of third-generation cephalosporins, which act by impeding bacterial cell wall synthesis. The formation of bacterial biofilm caused by *Pseudomonas aeruginosa* plays a pivotal role in facilitating bacterial resistance. Due to this reason, the antibiotics which are not effective against multi-drug resistance bacteria are not beneficial for the treatment of lower respiratory tract infections (LRTIs) as those antibiotics cannot destroy this biofilm layer as a result breathing difficulty and repeated lung infections persists. Thus, the objective of this research is to fabricate and characterize an inhalable CTX-loaded liposomal nanoparticles having greater antibiofilm effect prior to providing the higher concentrations of the drug in the infected local sites of the lungs.

Methods

- **Preparation of CTX-loaded liposomal nanoparticles**

Both blank and CTX-loaded liposomal nanoparticles were prepared by thin-film hydration technique using various concentrations of phosphatidylcholine, cholesterol, and Tween-80.

- **Particle size and zeta potential evaluation**

The average particle size and zeta potential of both blank and CTX-loaded liposomal nanoparticles were determined by dynamic light scattering for before and after freeze drying.

- **Morphology evaluation**

Particle shape and surface morphology of the prepared formulations were assessed by both transmission electron microscopy (TEM) and scanning electron microscopy (SEM).

- **Drug entrapment and drug loading evaluation**

The percentage of entrapment efficiency and drug loading were analyzed by HPLC method consisting mixture of acetonitrile and water (55:45 v/v) as a mobile phase with a flow rate of 1 ml/min.

- ***In vitro* drug release evaluation**

To assess the drug release, CTX-encapsulated liposomal formulations and free CTX solution (water), and CTX in water containing 0.8% Tween-80 were poured in dialysis bag (with a molecular cutoff of 12400 Da) and then stirred in a PBS (pH 7.4) medium using a magnetic bar and beaker at 150 rpm and at a constant temperature of 37˚C. Finally, the amount of drug release was determined using HPLC method.

Results

- **Preparation method of CTX-loaded liposomal nanoparticles**

The various formulations of CTX-loaded liposomal nanoparticles were prepared by thin film hydration technique. Briefly, the required amount of phospholipid (L-α-phosphatidylcholine) and cholesterol were dissolved in mixture of ethanol and chloroform (1:1) with vertexing around 5 minutes and allowed to evaporate the organic solvents. The thin lipid film was hydrated by deionised water then sonicated and stirred to obtain uniform particles.

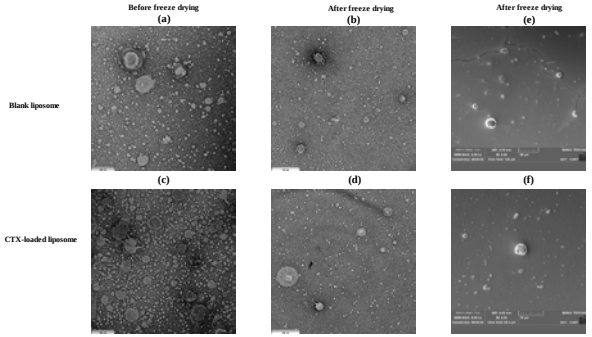
- **Particle size and zeta potential determination**

In this study, particle sizes were in the range of 100-400 nm and 100-300 nm, for before and after freeze drying, respectively. Further, all liposomal formulations exhibited a negative charge (approximately −45 to −60 mV).

Formulations	Particle size (nm)		Zeta potential (mV)	
	Before FD	After FD	Before FD	After FD
Blank liposome	169.40 ± 18.01	146.13 ± 12.40	-50.13 ± 1.91	-50.87 ± 1.32
F1	286.70 ± 52.57	208.43 ± 10.41	-55.53 ± 3.09	-47.53 ± 1.60
F2	90.66 ± 8.16	85.20 ± 1.15	-51.63 ± 2.75	-54.73 ± 0.93
F3	93.33 ± 0.45	75.62 ± 6.07	-45.83 ± 0.14	-33.17 ± 7.00
F4	428.70 ± 49.06	249.50 ± 6.94	-59.50 ±3.16	-50.07 ± 2.54
F5	501.30 ± 16.19	258.83 ± 4.50	-60.90 ± 3.29	-45.40 ± 0.62
F6	415.20 ± 55.80	232.00 ± 15.31	-51.63 ± 1.69	-44.17 ± 0.47
F7	417.57 ± 50.60	318.97 ± 43.93	-45.63 ± 2.23	-39.90 ± 3.55

- **Morphology evaluation**

Both blank and CTX-loaded liposomes (F3) showed spherical shape, no irregularities in the vesicle membrane before and after freeze drying.



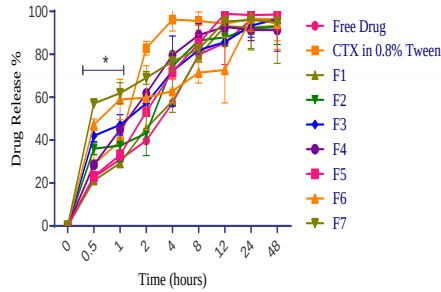
- **Determination of drug entrapment and drug loading %**

Increased concentrations of phospholipids (F3) in the liposomal nanoparticle composition led to enhance drug entrapment (94.02 % ± 3.25) and loading efficiency (18.02 % ± 1.27).

Formulations	Entrapment efficiency %	Loading efficiency %
Blank liposome	-	-
F1	62.01 ± 5.34	5.23 ± 0.67
F2	87.03 ± 7.60	11.30 ± 1.15
F3	94.02 ± 3.25	18.02 ± 1.27
F4	83.91 ± 0.90	8.21 ± 0.39
F5	71.73 ± 9.73	7.00 ± 0.84
F6	53.58 ± 3.47	9.14 ± 1.37
F7	48.29 ± 4.79	5.53 ± 0.34

- ***In vitro* drug release study**

The formulation (F3) resulting in the initial burst drug release of 42.0 % ± 2.80 then prolonged drug release of 93.36 % ± 5.39 and 96.41 % ± 1.00 at 0.5 hrs, 24 hrs and 48 hrs, respectively.



* $p < 0.05$ at 0.5 hour and 1 hour for free drug vs. F7, F1 vs. F6, F1 vs. F7, F5 vs. F7.

Conclusion

It is expected that the prepared liposomal CTX with prolonged release profile could effectively kill the resistant bacteria associated with LRTIs.

This research received no external funding.

Predictors of Health-Related Quality of Life in Major Trauma Patients: A Systematic Review and Meta-analysis

Zemedu Ferede[1,2], Vignesh Raman[1], Arpita Das[1,2], Silvia Manzanero[1,2], Jeffrey Lipman[2], Justin Kenardy[2], Beat Schmutz[2], Michael Schuetz[1,2], Dylan Flaws[1,3]

1 Queensland University of Technology, Brisbane, QLD, Australia 2. Jamieson Trauma Institute, Metro North Health, Brisbane, QLD, Australia 3. Critical Care Research Group, Adult Intensive Care Service, The Prince Charles Hospital, Brisbane, QLD, Australia

Introduction

- Identifying predictors of post-discharge health-related quality of life (HRQOL) in trauma patients is key to guiding personalized care and prioritizing those needing targeted interventions, ultimately optimizing recovery and improving outcomes.
- This review aimed to synthesize predictors of HRQOL in major trauma patients at least 6 months post-discharge.

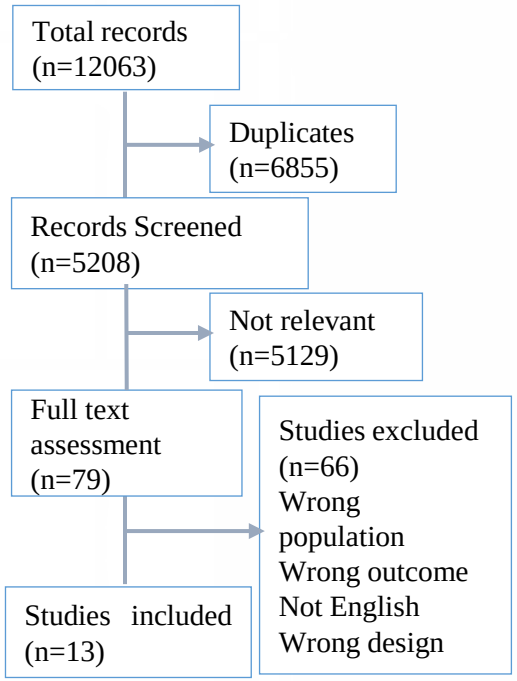
Methods

Search strategy
- PubMed, Embase, Scopus, Cochrane Library, and CINAHL were searched

Selection criteria
- Injury Severity Score (ISS) ≥ 12 /ICU admission, Age ≥ 18 years, studies with at least two predictors, English language

Quality assessment
- The risk of bias assessed by Quality in Prognosis Studies (QUIPS).
- GRADE approach were used for strength of recommendations

Figure 1: Prisma flow diagram



Results

- Mean age ranged from 20-75 years
- 11/13 were prospective cohort
- Majority used mail survey, 3 used phone call
- 54% used EQ-5D, and 31% used SF-36, remaining used SF-12 & SIP.

Figure 3: Forest plot Female and ASA score

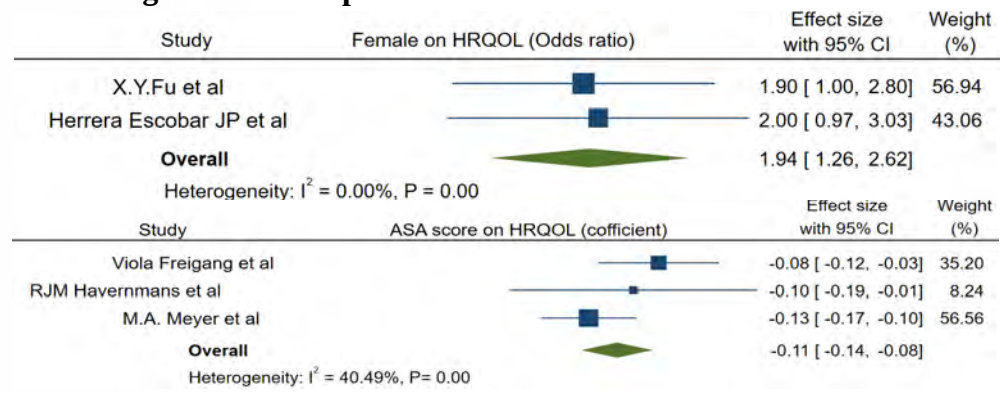


Figure2: Predictors of HRQOL

Predictors	Overall HRQOL	PCS	MCS
Increasing age	↓	↓	↑
Female	↓	0	↓
Increasing ASA score	↓		
Psychiatric comorbidity			↓
Increasing Hospital length of stay	↓	↓	0
Increasing ISS		↓	0
Extremity injury	↓		

NB: ↑ Positive association ↓ Negative association 0 Non significant association,

ASA: American Society of Anaesthesiology, MCS: Mental Component Score, PCS: Physical Component Score

Conclusion

- Overall, this systematic review revealed that increasing age is associated with better mental health, but worse physical health. Despite having a lower overall HRQOL, females are particularly vulnerable to poor mental health.
- Poorer HRQOL was associated with higher ASA scores, extremity injuries, and longer hospital stays. However, a high ISS score was associated with worse physical outcomes but not with mental health.
- Further research is needed to explore the effects of specific injury and hospital-related factors on longer term outcomes.

Inhalable spray-dried microparticles of combined antibiotics for developing dry powder inhaler formulations against lung infections

Ruwani K. Suraweera[a*], Kirsten M. Spann[b], Emad Kiriakous[c], Timothy J. Wells[d], Nazrul Islam[a,b,]

[a] Pharmacy Discipline, School of Clinical Sciences, Faculty of Health, Queensland University of Technology, Brisbane, QLD 4000, Australia
[b] Centre for Immunology and Infection Control (CIIC), Faculty of Health, Queensland University of Technology, Brisbane, QLD 4000, Australia
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[d] Frazer Institute, Faculty of Medicine, The University of Queensland, Brisbane, QLD 4102, Australia

Introduction

Spray drying technology has gained high popularity in manufacturing dry powders for inhalations. Scalability, adaptability, simplicity and ability to maintain consistent powder quality throughout the operation are benefits of spray drying. It is a single-step manufacturing technique with the ability to engineer dry powder particles with optimized inhalation characteristics. This study aimed at formulating and manufacturing inhalable sized spray-dried microparticles of dual antibacterials ie., levofloxacin (LVX) and ambroxol (AMB).

Method

Formulation of dry powder particles with spray drying

Antibacterial solutions were spray dried with different spray drying parameters to optimize the spray drying conditions to obtain inhalable particles with high product yield. With the optimized parameters, combined antibacterial spray dried formulations composed of varying mass ratios of LVX and AMB with or without incorporating leucine (LEU) were prepared.

Particle size and morphology analysis

Particle size and surface morphology of spray dried particles were analysed under scanning electron microscope.

Attenuated total reflection- Fourier transform infrared (ATR-FTIR) spectroscopy

FTIR analysis was performed for the spray-dried formulations and raw antibacterials to study the chemical compatibility.

Aerosolization studies

Twin stage impinger (TSI) which represent the respiratory tract was used to analyse the aerosolization properties of spray dried formulations. Fine particle fraction (FPF) of drugs which reached the stage 2 of TSI (representing lower respiratory tract) was calculated with respect to emitted dose (ED) and recovered dose (RD).

Results and Discussion

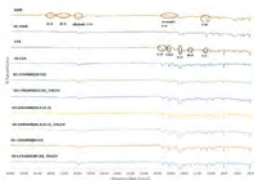
Optimized spray drying parameters

- feed concentration 1mg/mL
- inlet temperature 120± 2 °C
- aspiration 100%
- airflow 473 L/h
- feed flow rate 4.5 ml/min
- outlet temperature 60- 70 °C.

Figure 1: Optimized spray drying parameters

- Spherical shaped particles were observed.
- Addition of LEU decreased the particle aggregation leading to particle size reduction.

Figure 2: Scanning electron microscopy images of spray dried products; LVXAMB(50:50)(*2K)[a], LVXAMB(66.6:33.3)(*2K)[b], LVXAMB(80:20)(*2K)[c], LVXAMB(50:50)_5%LEU(*2K)[d],LVXAMB(66.6:33.3)_5%LEU(*2K)[e],LVXAMB(80:20)_5%LEU (*2K)[f]



- Absence of major ATR-FTIR peak shifts confirmed that no chemical interactions occurred between LVX, AMB and LEU.

Figure 3: FTIR spectra of levofloxacin, ambroxol and spray dried formulations

Table 1: Product yield and particle of spray dried levofloxacin (LVX) and ambroxol (AMB) formulations with and without leucine (LEU)

Formulation	Spray drying yield (%)	Particle size (µm)
SD-LVX	40.8	2.9±1.2
SD-AMB	45.9	2.2± 1.3
SD-LVXAMB(50:50)	46.7	2.5± 1.3
SD-LVXAMB(50:50)_5%LEU	55.3	1.9± 1.2
SD-LVXAMB(66.6:33.3)	45.2	2.6± 1.7
SD-LVXAMB(66.6:33.3)_5%LEU	49.0	2.5± 1.1
SD-LVXAMB(80:20)	42.5	2.7± 1.1
SD-LVXAMB(80:20)_5%LEU	43.8	2.3± 1.4

- Particle size of the formulations were within the inhalable range (1-5 µm).
- Incorporation of LEU has reduced the particle size of the prepared microparticles. However, statistically significant reduction ($p < 0.05$) was observed only in LVX: AMB (50:50) formulations.

Table 2: Aerosolization results of spray dried levofloxacin (LVX) and ambroxol (AMB) formulations

	LVX		AMB	
Formulation	FPF (%) from RD	FPF (%) from ED	FPF (%) from RD	FPF (%) from ED
SD-LVX	26.3± 1.0	47.6± 0.8	-	
SD-LVXAMB(50:50)	39.0± 1.9	57.8± 1.1	37.5± 2.2	56.1± 0.9
SD-LVXAMB(50:50)_5%LEU	48.7± 4.0	66.7± 2.8	48.3± 1.6	66.3± 1.1
SD-LVXAMB(66.6:33.3)	34.3± 1.5	56.8± 0.9	33.7± 2.7	55.9± 1.5
SD-LVXAMB(66.6:33.3)_5%LEU	44.8± 1.5	64.5± 1.0	44.4 ± 2.6	63.8± 1.7
SD-LVXAMB(80:20)	30.8± 1.3	56.6± 0.8	31.7± 4.7	57.2± 3
SD-LVXAMB(80:20)_5%LEU	42.1± 1.3	68.2± 1.1	43.4± 4.4	69.0± 4.3

- With the addition of LEU in the formulations, %FPF of LVX and AMB improved significantly.
- SD-LVXAMB(50:50)_5%LEU presented the best aerosolization parameters

Conclusion

The spray dried microparticles of the combined antibacterials are expected to be used as a suitable dry powder inhaler formulation against lung infections.

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Evaluating the necessity of long-term antibiotics after splenic artery embolization for blunt splenic injury: a scoping review

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Background

Splenic artery embolization (SAE) is a minimally invasive, endovascular procedure that serves as an alternative to splenectomy for treating blunt splenic injuries. It allows for splenic preservation, reducing the risk of overwhelming post-splenectomy infections (OPSI).[1] Currently, there are no standardized guidelines on antibiotic prophylaxis post-splenic artery embolization. Spleen Australia does not endorse the routine use of daily antibiotic prophylaxis for splenic artery embolization, but this guidance is ultimately superseded by the judgment of the managing clinician.[2] Conversely, some studies support the use of antibiotics post-embolization.[3,4] This apparent discordance highlighted the need for a comprehensive literature review aimed at determining the necessity of prophylactic antibiotics post-SAE by examining the rate of infectious complications and whether antibiotic use reduces these rates.

Methods

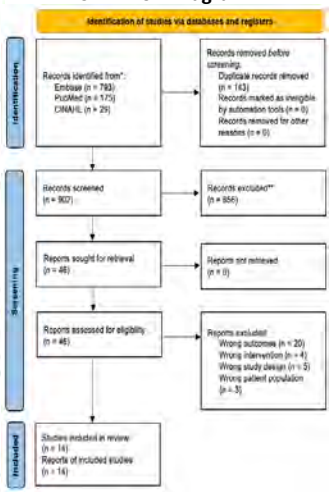
Search Strategy
- Databases: PubMed, Embase, CINAHL
- Published between 2003-2024
- Keywords: spleen, embolization, antibiotics, prophylaxis, infection

Study Selection

Studies were included if they:
- Reported splenic angioembolization post-blunt splenic trauma
- Reported infectious complications post-SAE
- Were written in English

Data Extraction
- Data was extracted from each included study by 2 reviewers (AF and JZ)
- Data extracted included study details, population demographics, and patient outcomes

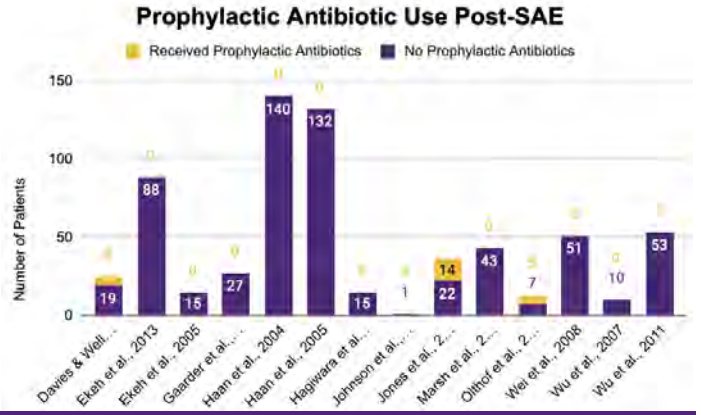
PRISMA Flow Diagram

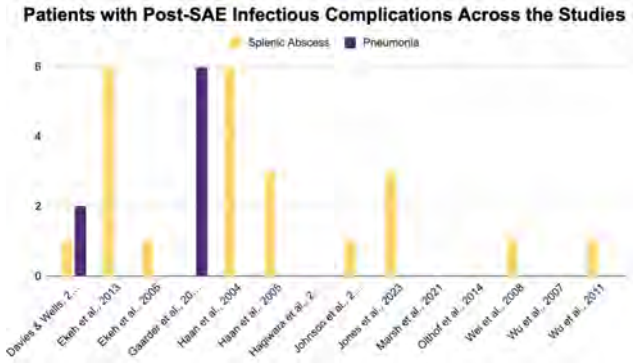


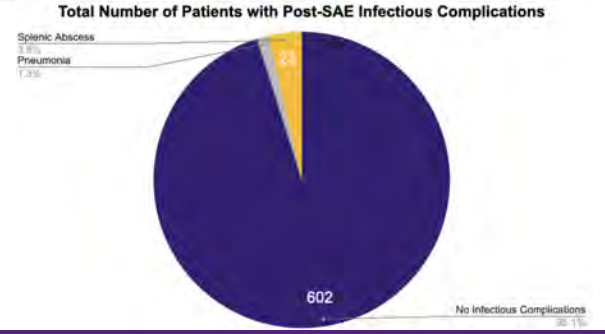
Results

Literature Search Results

- The search identified 902 studies, of which **14 studies** were included.
- **648 eligible patients** were identified from these 14 studies.
- The majority of studies originated in the USA
- The majority of studies were retrospective reviews.
- Sample size ranged from 1 - 140.
- Mean ages ranged from 30.5 to 52 years, with around 70% of patients being male.
- Infectious complications were reported in 33 (5%) patients.
- Mean ISS ranged from 19.9 to 30.5.
- No studies reported OPSI.







Discussion

Infectious complications post-trauma are reported in 6.8% and 5.56% of patients in large U.S. and Japanese database studies, respectively.[5,6] This review found a 5% complication rate, suggesting that this intervention does not greatly raise infection risks compared to general trauma outcomes. Prophylactic antibiotics were administered to only 25/648 patients, from 3 of the included studies. Important information regarding the indication, regimen, and administration timing was lacking, challenging the temporal relationship in most cases. Information regarding high-risk cohorts including older and immunocompromised patients was not included.

Conclusion

Overall, this scoping review revealed limited use of antibiotics post-SAE and insufficient data to determine their impact on preventing infectious complications. Evidence on the necessity, or lack thereof, of antibiotic use in both the general post-SAE population and specific groups, such as the immunocompromised or elderly, remains inconclusive.

Further research is needed to ascertain the incidence of post-SAE infections and to ultimately establish a protocol for post-SAE antibiotic prophylaxis.

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Acknowledgement

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HERSTON HEALTH PRECINCT SYMPOSIUM 2024

Simplifying Lingo: The use of large language models in simplifying research on Rheumatoid Arthritis

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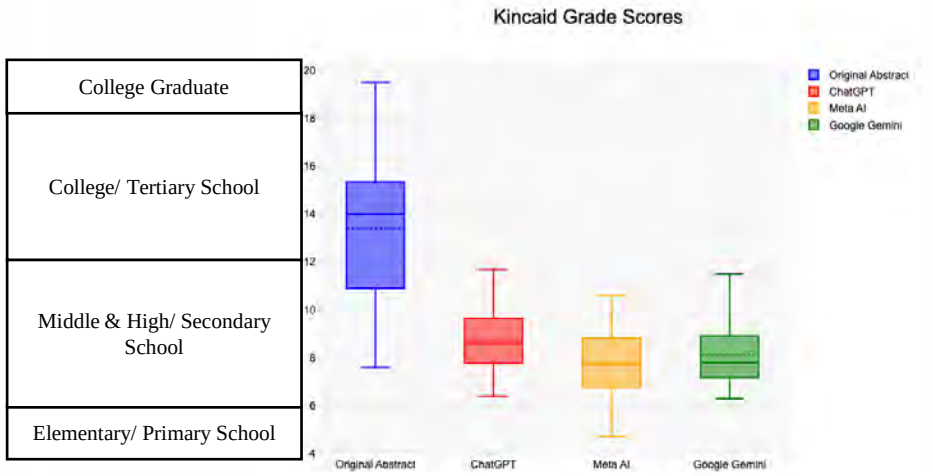
2. University of Queensland- Ochsner Clinical School

Purpose

Rheumatoid arthritis (RA) is a common condition affecting many people worldwide. Research is constantly being pursued surrounding the emergence of new treatments as different biological targets are being investigated to treat RA. In today's digital age, it is common for patients to research their medical conditions and treatments after appointments and come across these publications online. The purpose of this study was to evaluate the ability of large language models (LLM) to simplify research articles to the level of an average patient.

Methods

Papers from the RA section of *Arthritis & Rheumatology* starting from January 2023 were selected. ChatGPT, Meta AI, and Google Gemini used the same prompt to rewrite the abstract of each paper so that it could be understood by an average reader. Flesch-Kincaid grade-level and ease scores were calculated for the original abstracts as well as the outputs from the LLMs for the statistical analysis.



Results

The Flesch-Kincaid grade-level scores of the original abstracts were 13.3 compared to 8.7, 7.8, and 8.2 and ease scores of the original abstracts were 25.0 compared to 58.4, 59.0, and 63.3 for ChatGPT, Meta AI and Google Gemini respectively ($p<0.05$).

Discussion

The research indicates that the LLMs were able to reduce the average grade-level to near 8th grade level and increase the ease of reading the abstract. Future research will focus on including further papers as more volumes of the journal are released and analyzing the content of the responses to assess how complex information is converted into simpler language while maintaining quality and the main points.

A practice review of scar interventions to manage facial burns

Samantha Carman[1], Dr Andrea Mc Kittrick[1] & Dr Jason Brown[2]
[1]Occupational Therapy, RBWH [2] Professor Stuart Pegg Adult Burns Centre, RBWH

Background

There are many complexities in the management of facial burns due to the anatomical structures and risk of developing scar contractures. The face is considered a large part of an individual's identity as it is the most visible body part and is unique to each person, therefore requiring specialised treatment to determine the impact of the injury on the individual [1].

The Professor Stuart Pegg Adult Burn Centre at RBWH, is the state-wide specialist facility for adult burn care in Queensland. Burn injuries that include facial burns meets referral criteria for management at a specialised burns centre [2]. Given the complex nature of facial burns specialised intervention is required to achieve optimal outcomes [3].

The care of burns largely focus on wound healing, minimizing scarring and maintaining function [4,5].

At the Royal Brisbane and Women's Hospital (RBWH), there is a strong multidisciplinary team approach to burn management. Treatment modalities include wound management, surgery, splinting, scar management and rehabilitation [6]. Splinting can include using taping, mouth splints and static transparent facial orthosis [5]. Scar management can include use of scar massage, compression and the use of silicone products [5]. Rehabilitation involves range of motion programmes, stretching, exercise and participation in activities of daily living.

Aim

The aim of this study was to review current occupational therapy practice for scar management of facial burns managed at the Royal Brisbane and Women's Hospital (RBWH).

Methods

Study Design

This was a retrospective review of occupational therapy practice for the management of facial burns managed at RBWH between 2018 and 2022.

Ethics

Ethical review was approved by the local HREC committee (Ex/2023/MNHA/94253).

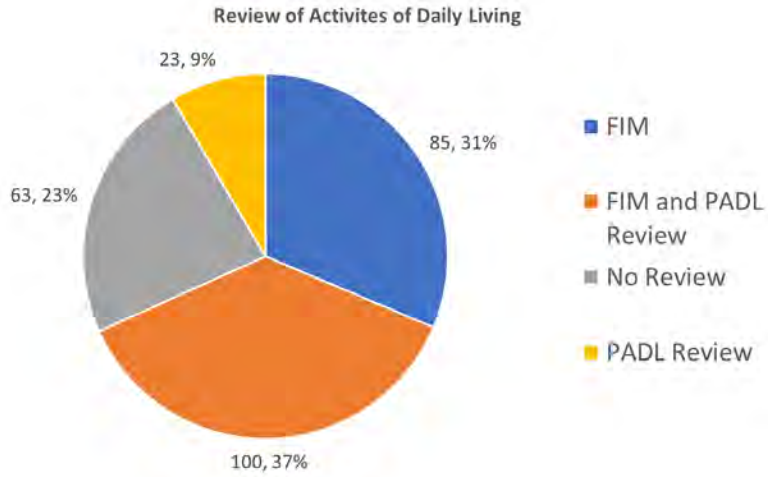


Figure 1: Number of patients that received review and percentage of each type of review.

Figure 2: Number of patients that received scar management and type of intervention.

Results

A total of 272 files met the inclusion criteria for review.

Demographics data included: Sex (n =46 F, n= 226 M) and age (mean = 41.83 years). Burn data collected included: Total Body Surface Area (TBSA) burnt (average 25%) and burn depth to the face (varied from erythema to full thickness).

Surgical data included: n= 48 required surgical management of their facial burns.

Occupational Therapy Burn Scar Interventions:

Range of Motion Programme:

50.18% of individuals managed at RBWH received a range of motion programme for their face from the Occupational Therapist and/or Physiotherapist.

Personal Activities of Daily Living:

n =208 individuals received a review of personal activities of daily living (PADL) via Occupational Therapy inclusive of feeding and oral hygiene activities as defined by the Functional Independence Measure (FIM) or via observation of PADL participation in feeding and oral hygiene **Figure 1.**

Scar Management:

Long term compression garments were required for n= 12 individuals. Splinting of the mouth was indicated for n=8 individuals. Prevention of eyelid ectropion was required for n= 7 via taping and silicone therapy was provided for n=9 individuals **Figure 2.**

Conclusion

Occupational Therapy practice at RBWH for the management of facial burns is in line with the Australia and New Zealand Burns Association Burns Trauma Rehabilitation: Allied Health Practice Guidelines.

Acknowledgements

Thank you to Leanne Dornan-Lund and Angelo Kelis Occupational Therapy students for their assistance with data collection. If you would like a copy of the reference list please scan here

Exploration of devices used in clinical practice to prevent burn scar contractures of the nose

Dr Andrea Mc Kittrick[1], Emma Cooper Parker[2], Henry Meland[2], Dr Jason Brown[3]

[1]Department of Occupational Therapy- Royal Brisbane and Women's Hospital, [2]Australian Catholic University, [3]Professor Stuart Pegg Adult Burns Centre - Royal Brisbane and Women's Hospital

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Background

Burn injuries to the face are complex and require a multidisciplinary approach to ensure long term outcome are acceptable to the individual who sustained them (Cambiaso-Daniel et al., 2018; Parry et al., 2013). Burn scars are hypertrophic in nature (Finnerty et al., 2016). The contractile forces resulting from a burn scar have the potential to cause disfigurement and impact function (Hawkins et al., 2018).

Occupational Therapy interventions for burn scar management include scar massage, splinting, use of compression and silicone therapies, to prevent long term scar contractures and functional disruption (Edgar, 2014). The nares of the nose are at high risk of contracture due to their anatomical shape (Serghiou et al., 2018). The nares can contract inwards resulting in closure of the nostrils or contract upwards resulting in disfigurement (Parry et al., 2010). Splints and garments are often used to provide a counter force to the scar contracture during the rehabilitation phase (Edgar, 2014). However often occupational therapists fabricate their own splints to custom fit the individual, given the complexity of the nose there is a risk for developing pressure injuries using this method, which can lead to negative consequences for the individual.

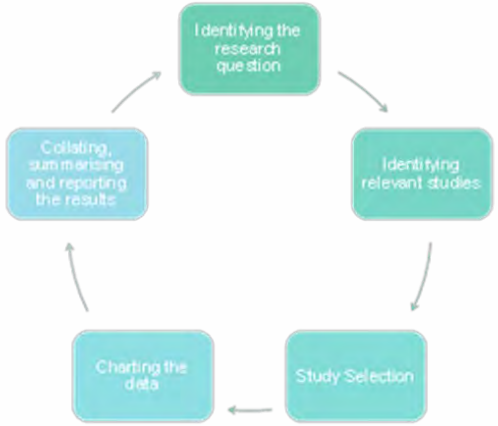
Aims

To review the literature to determine what devices are described in studies to prevent burn scar contractures of the nose.

To survey other burn units within Australia and New Zealand to determine what devices they use to prevent burn scar contractures of the nose.

Methods – Scoping Review

For this review, devices were defined as nonsurgical interventions that may include splints, tapes, molds, or conformers with the aim of reducing the impact of burn scar contractures of the nose.



Methods – Survey

Identifying the relevant studies

- Six databases (CINAHL, Medline, SCOPUS, Web of Science, PubMed and Cochrane) were searched
- Time frame: January 2008 - August 2023

Study selection

Inclusion criteria

- Studies reporting devices to prevent burn scar contractures of the nose, adult population, published in English.

Exclusion criteria

- Paediatric populations: surgical interventions focusing on reconstruction or interventions where burn injury was not the primary mechanism

Results

The initial search identified 66 studies. Removal of duplicates resulted in elimination of 29 studies. Abstracts of 37 studies were reviewed. The final number of studies included in this review n=4. Devices described in literature trialled on patients included silicone gauge earring plugs (which were inserted into nostrils), nasal aperture post op splinting (v shaped splint along the columella), nasal stents, rigid Uvex compression masks, soft cloth compression masks and silicone gel sheets. Study size varied but only the case studies described the devices in detail. Three additional articles were found which described making a device via 3D printing, using semi rigid tubing and using a silicone lined transparent face mask to improve scar outcomes. There were no reports of these devices being implemented into clinical practice. Six occupational therapy clinicians responded to the survey. All used devices in clinical practice to prevent burn scar contractures of the nose. Devices used in practice by specialist burns OTs were: 1) nostril retainers, 2.) nose conformers, 3.) silicone moulds, 4.) Koken nose splint®, 5.) nasopharyngeal tubing, 6.) snore stoppers and 7). paediatric sizing kit for nasal specs fabricated from thermoplastic. Training and previous skills in splinting were required to fit/fabricate devices. Prevention of pressure injuries was reported by all participants. Techniques included teaching patients' to independently self-management the devices to monitor for pressure areas and close monitoring for individuals who were admitted at the time device application, and this was divided between OTs and nursing staff. Average time to fit or fabricate a device was 30 minutes. All participants reported person specific factors required consideration during this process. Thermoplastics, alginate and Otoform were used to fabricate devices.

Conclusion

Burn injuries are classified as catastrophic injuries and burn injuries to the face can have functional and cosmetic consequences. Depending on the severity of the burn injury adjacent tissue made be damaged thereby limiting the surgical options for repair in deep dermal and full thickness burns. Anatomically the nose poses a challenge to burn surgeons and burn therapists alike. For many individuals' reconstruction can require two or more procedures. Little objective and subjective data has been reported in the literature, therefore, the impact on – self-esteem and satisfaction are unknown. This is an area that remains largely unexplored for individual with burn injuries to their nose.

Predicting successful weaning off CPAP in preterm infants: a retrospective analysis

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[2]QIMR Berghofer Medical Research Institute, Herston, Qld
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Background: Respiratory Distress Syndrome (RDS) is the most common diagnosis after premature birth. CPAP is an important part of respiratory management of extremely preterm babies (Figure 1), however, there has not been significant research into the best time to wean off CPAP and on which method of weaning is optimal. This study was an analysis of factors associated with success or failure in weaning CPAP of extremely preterm babies cared for at the RBWH neonatal intensive care unit (NICU).

Methods: Data was collected retrospectively from the neonatal database and electronic medical records over a 12-month period. Included babies were those born less than 28 weeks gestational age and who required CPAP. The primary outcome was to determine what clinical factors were associated with success for coming off CPAP on the first attempt.

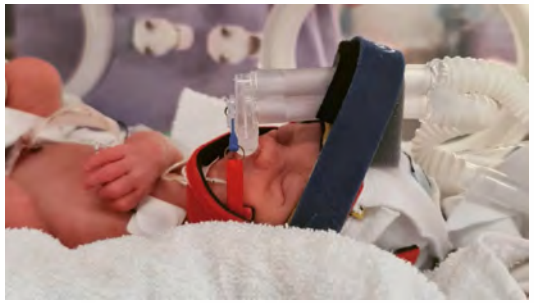

Figure 1: Continuous Positive Airway Pressure (CPAP) is the main management of respiratory distress in premature infants.

Conclusion: Extremely premature and extremely low birthweight babies were more likely to be weaned off CPAP at the first attempt compared to more mature babies at birth or those who had a higher birthweight. No other clinical factors correlated with first time off CPAP success. Predicting CPAP weaning success can help to reduce morbidity associated with being born preterm.

Results: From January 2019 to December 2019 there were 55 infants who met inclusion criteria and were included for analyses. Extremely preterm babies were more likely to be weaned later than babies born at an older gestational age and were more likely to be successful, when coming off CPAP on their first attempt. For every week of increased gestational age at birth, it increased the chance of an unsuccessful first attempt by 2.3 times. Categorical comparisons of infants born <26 weeks gestational age and <750 grams for a successful CPAP wean were statistically significant. No other clinical factors were associated with a first wean off CPAP success.

Clinical Factors (n=55)	First attempt unsuccessful (n=31, 56%)	First attempt successful (n=24, 44%)	P value/*Chi-squared
Gestational age (mean ± SD)	26.5 ± 0.18	25.4 ± 0.25	0.005
Birthweight (mean ± SD)	910g ± 32.9	736g ± 30.0	0.002
BW <750g	3	17	*0.001

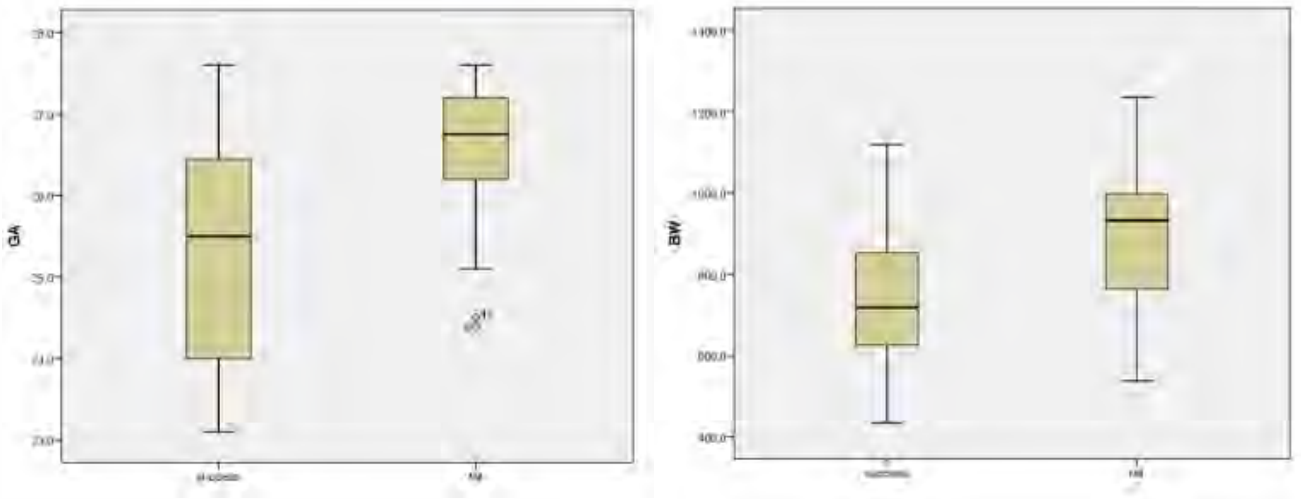

Figure 2: Gestational age and birthweight at first attempt weaning off CPAP, success verses failure, impacts preterm infant morbidity

Establishment of head and neck cancer-derived circulating tumour cell culture model

Xiaomin Huang[#1], Xi Zhang[#1,2], Chameera E. Weeramange[1,2], Paul Leo[3,4], Brett G.M. Hughes[5,6], Riccardo Dolcetti[7,8,9,10], Bijun Zeng[7,8], Roberta Mazzieri[7,8], Gunter Hartel[11], Rahul Ladwa[5,12], Majid Ebrahimi Warkiani[13], Jean Paul Thiery[14], Touraj Taheri[5,15], Lizbeth Kenny[5,6], Sarju Vassaini[5,16], Chamindie Punyadeera[1,2,*]

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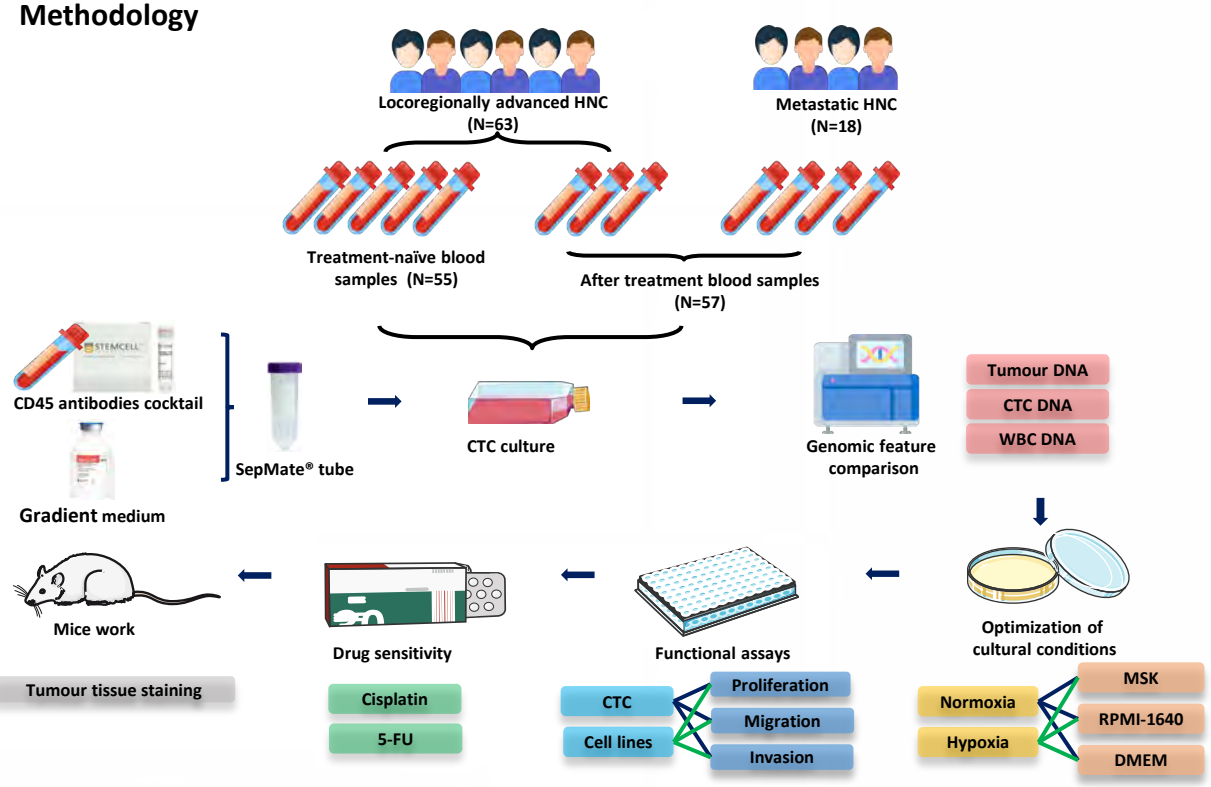
# These authors contributed equally to the project. ***Corresponding author**, Prof. Chamindie Punyadeera: c.punyadeera@griffith.edu.au

Background

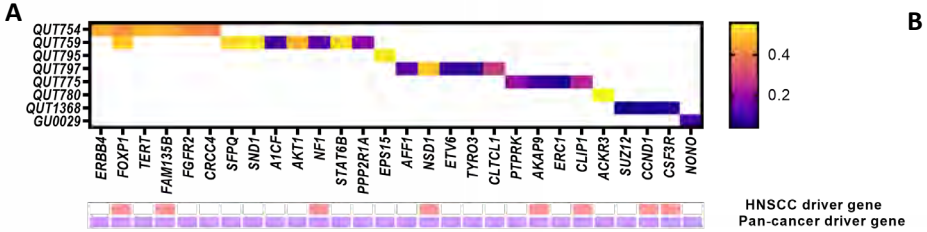
- Metastasis remains the primary cause of cancer-related deaths in head and neck cancer (HNC), and it is facilitated by the dissemination of circulating tumour cells (CTC) either from the primary tumour site or metastatic sites.
- Due to the rarity of CTCs, in vivo/in vitro models are needed to expand CTCs for research purposes.
- We aim to establish a protocol for CTC cultures to test current drugs in a timely manner.

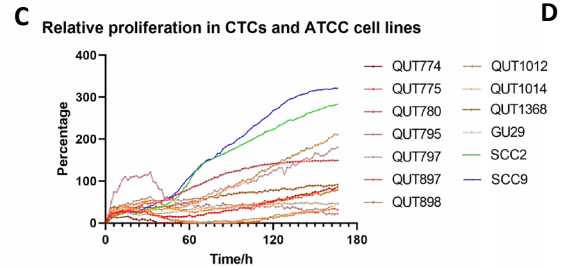
Methodology

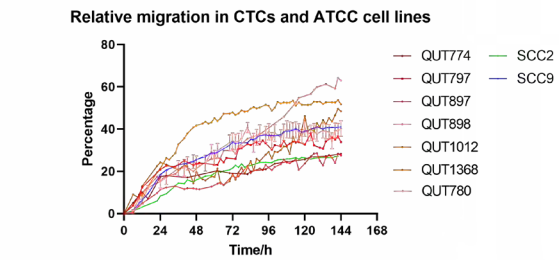


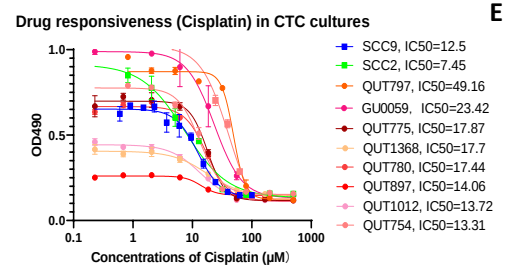
Results and Conclusions

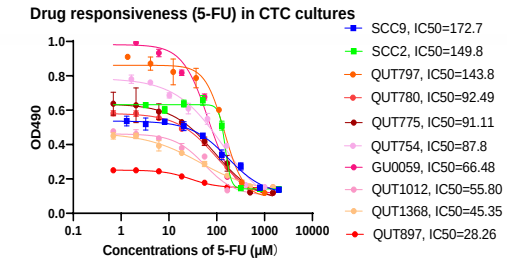
- HNC-derived CTC cell lines were established (N=16), and p16 positive HNC generated a higher cultural rate (15.66% vs. 2.41%, p=0.0386).
- CTC cultures had cancer genomic features and common mutated genes.
- CTCs shared similar tumoral functions with HNC cell lines (SCC2 and SCC9).
- CTC cultures could be applied to drug response assays.
- CTC cultures generated in vivo tumours that shared similar pathological features with the primary tumour.











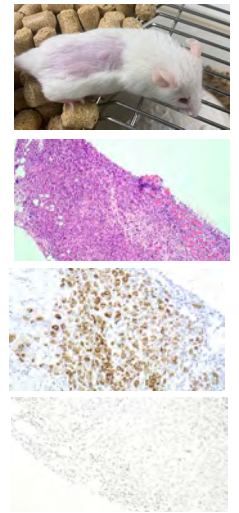


Figure A. Pan-cancer drivers and HNC drivers were defined in eight CTC cultures. Figure B. Common mutated genes among eight CTC cultures. Figure C. Functional assays, including proliferation and migration assays in CTC cultures and ATCC HNC cell lines. Figure D. Drug responses in CTC cultures and ATCC HNC cell lines. Figure E. Tumorigenesis of CTC cultures, atypical cells infiltrated muscle and cytokeratin AE1AE3.

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

The ELVIS Study: Efficacy of LVIS EVO Assisted Coil Embolisation in Treating Unruptured Saccular Intracranial Aneurysms.

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Background

Endovascular embolisation is a well validated and commonly-used treatment for intracranial aneurysms. Unruptured intracranial aneurysms (UIAs), especially those that are wide-necked, are often treated by stent-assisted coil embolisation (SAC), with placement of an endovascular stent within the parent vessel to prevent coil prolapse out of the aneurysm. The ideal stent would be flexible, appose well to the vessel wall, be visible to the operator, have low thrombogenicity, and be deliverable via as small a microcatheter as possible. Because stent placement promotes thrombosis, patients need interim antiplatelet medication. Stent design is a compromise between low metal content (less thrombogenic but invisible or poorly visible to the operator) and higher metal content (more thrombogenic but more clearly visible). Some of the latter are braided stents (with braided metal fibres to form a loose or tight mesh).

SAC can be performed using several techniques:

1) Jailing: trapping the microcatheter in the aneurysm then placing a stent across the aneurysm neck, followed by coiling;
2) Stent placement followed by placing a microcatheter through the stent into the aneurysm, which is then coiled;
3) Coiling or part coiling of the aneurysm followed by stent placement;
4) Variations include the use of more than one stent, e.g. Y-stent placement in a bifurcation vessel.

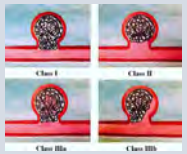
The Low-Profile Visualised Intraluminal Support Enhanced Visibility and Opening (LVIS EVO) stent (MicroVention®) is a new braided stent, released 2020, with several structural innovations reported to improve procedural efficacy, including: Smaller cell size - reduces incidence of intra-procedural coil prolapse; Compatibility with smaller microcatheters - allowing access to more distal aneurysms of smaller arteries; Radio-opaque markers – improve stent visibility on digital subtraction angiography (DSA); 'Flow diversion' effect due to better wall apposition (higher surface area coverage with metal) and smaller mesh size.

Aim

Determine the efficacy and safety of LVIS EVO SAC for elective treatment of UIAs.

Methods

Retrospective single-center audit to determine the peri-procedural, immediate, medium, and long-term outcomes post treatment of saccular UIAs with LVIS EVO SAC. Outcomes of interest:



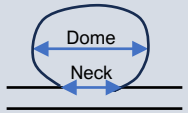
©Mascitelli et al. (2015) An update to the Raymond–Roy Occlusion Classification of intracranial aneurysms treated with coil embolization. Journal of NeuroInterventional Surgery 7:496-502

- Complete occlusion rates (graded using the modified Raymond-Roy classification; MRRC) – Grade 1 or 2 = complete occlusion Grade 3a or 3b = residual aneurysm Graded on DSA (at end of procedure), CT or MRI (on follow-up).
- Complications (thromboembolic events, bleeding, or procedural adverse events).
- Change in 30-day modified Rankin scale (mRS) scores - measure of clinical outcomes.

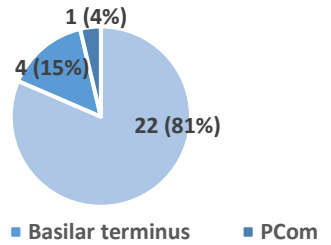
Results:

Baseline Characteristics

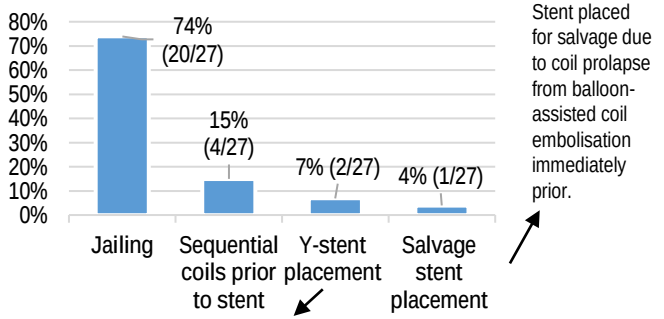
- 27 aneurysms, 26 patients; 8 males (30.8%), 18 females (69.2%)
- Mean age 58 (27 – 70) years
- Mean diameter 6.73mm (median 5.5mm)
- Mean dome:neck ratio 1.60 (median 1.60)
- Most (24/27) aneurysms wide-necked, defined as dome:neck ratio ≤ 2.0



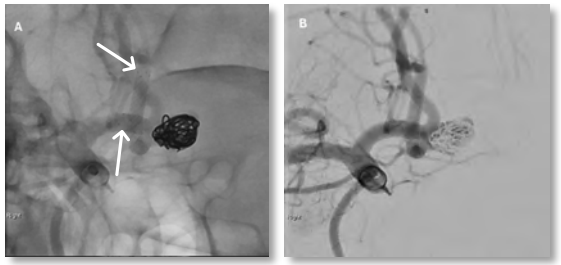
Aneurysm locations



Treatment techniques



Y-stent placement involved 2 LVIS EVOs in one case, and a LVIS EVO with a Neuroform Atlas in the second case.



A) Anterior communicating artery aneurysm treating with jailing. Arrows demonstrate adequate stent positioning. B) Residuum (MRRC 3a) on post-op DSA.

Outcomes

Complete occlusion rates:

- 55.6% (15/27) immediately post-procedure
- 85.2% (23/27) at 3-month (medium term) follow-up
- 84.2% (16/19) at a median of 12-month (long-term) follow-up
- 7.4% (2/27) aneurysm recurrence rate.

Complication rates:

- No procedural complications (technical success rate 100%)
- Post-procedural thromboembolic infarcts in 7.4% (2/27), diffusion-weighted imaging lesions on MRI performed within 48 hours post-procedure (suggestive of small embolic thrombi) in 12.5% (2/16); all asymptomatic.

Clinical outcomes:

- No significant changes in mRs scores at 30-day follow-up.

1 case of inadequate stent opening requiring a second LVIS EVO that was successfully deployed; and 1 case of minor coil prolapse during jailing, with no further complications, were noted. In both, aneurysms remained completely occluded at last follow-up. 1 case of superior cerebellar artery (SCA) branch occlusion after deploying LVIS EVO across the SCA origin was noted, possibly due to LVIS EVO's flow diversion effect. This was managed successfully with Integrilin® bolus, and no further complications were seen post-procedure.

Conclusion

This single centre retrospective audit of outcomes using this novel device demonstrates acceptable rates of procedural success, aneurysmal occlusion, and complications after LVIS EVO-assisted coil embolisation of saccular UIAs, at periprocedural, medium and longer term time points. These results are comparable with other recent publications in supporting the use of LVIS EVO for this indication.

Slowing kidney disease with weight loss: A randomised controlled feasibility study

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1. Princess Alexandra Hospital, Brisbane, Australia. 2. School of Exercise and Nutrition Sciences, Queensland University of Technology, Brisbane, Australia. 3. Royal Brisbane and Women's Hospital, Brisbane Australia. 4. Consumer representative, Brisbane, Australia, 5. Flinders University, Adelaide, Australia. **Email: marguerite.conley@health.qld.gov.au.** **Acknowledgements: Kidney Health Australia Research Grant.**

Background

- Low energy diets (LEDs) (800-1000 kcal/day) can lead to 10 to 15kg weight loss and diabetes remission.[1]
- No randomised controlled trials have examined LEDs in chronic kidney disease (CKD) limiting their use.
- **Aim:** To test the feasibility and safety of a low energy diet and weight management program in individuals with obesity and CKD.

Method

- 49 adults from Brisbane Australia, with stages 1-3b CKD + BMI ≥30kg/m^2 + proteinuria, randomised (1:1)
- **LED group =** 3-month LED with meal replacements and low-calorie foods, + dietitian support, followed by 3-month maintenance phase (healthy eating & exercise support).
- **Usual care group** = Optional weight loss support through kidney clinic.

Figure 1. Sample LED plan consisting of a combination of meal replacement and low energy food items.

Results

- Median age 51yrs, BMI 39kg/m^2, eGFR 59ml/min/1.73m^2, 57% male.

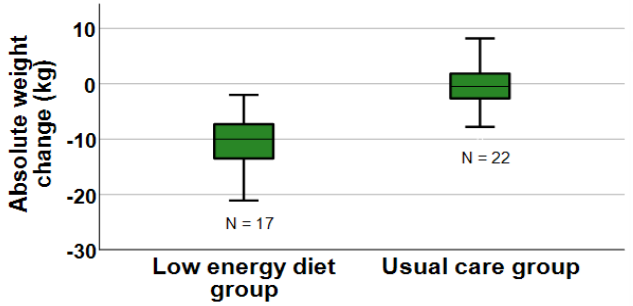
Primary outcomes: Safety and feasibility (Table 1)

- Two hospital admissions in each group, attributed to hypoglycaemia & acute kidney injury.
- Hyperkalaemia (≥ 5.5 mmol/L) was the most common adverse event, (4 episodes in each group).

Primary outcome	Pre-specified criteria	Result	Met
Safety	Similar serious adverse events in both groups	2 in the both groups	**Yes**
Feasibility			
Recruitment rate	≥ 25 % of all eligible patients who can be contacted are recruited	46% (n=49/107) were recruited	**Yes**
Retention rate	≥ 75% of recruited LED group retained at 6 months	67% (n=16/24) were retained	**No**
Weight loss	≥ 30% of LED group with ≥ 10kg weight loss at 3 months	46% (n = 11/24) achieved ≥ 10 kg	**Yes**

Table 1. Safety and feasibility outcomes against pre-specified criteria. Feasibility met if safety and two or more of recruitment, retention and weight loss criteria achieved

Figure 2. 3-month weight change (kg) by treatment group



Conclusion

- LEDs are safe and feasible under professional and show promising efficacy as a treatment option for obesity in adults with CKD.
- A definitive RCT exploring the use of LEDs to improve clinical outcomes and slow progression of CKD is warranted.

1. Lean et al. 2018. Primary care-led weight management for remission of type 2 diabetes (DiRECT): an open-label, cluster-randomised trial. doi:10.1016/S0140-6736.

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

Creating New Synergies to Examine Kidney-adipose Tissue Cross-talk during Weight Loss in Adults with Obesity and Chronic Kidney Disease (CKD)

Helen L. MacLaughlin[1, 2], Ying C. Yuen[1], Marguerite M. Conley[1, 3], Lisa K. Philp[1]

[1]Queensland University of Technology, Brisbane, QLD, Australia; [2]Royal Brisbane and Women's Hospital, Herston, QLD, Australia; [3]Princess Alexandra Hospital, Woolloongabba, QLD, Australia

Introduction

Mechanisms linking obesity and CKD include energy, adipokine and metabolic homeostasis imbalances. Adiponectin, leptin and fetuin-A play critical roles in these pathophysiological processes.

Aim

To investigate the effect of intentional weight loss on adipokines, fetuin-A, and urinary NGAL levels in people living with obesity and CKD.

Methodology

- 49 adults with BMI >30kg/m², CKD stages 1-3b and urinary protein/creatinine ratio >3mg/mmol
- Randomised to either a low energy diet and exercise intervention (LED) or usual care (UC)
- Blood and urine samples were obtained at baseline, 3 and 6 months
- Serum adiponectin, leptin, fetuin-A, cystatin-C and urinary NGAL levels were measured using ELISA
- Mean differences and associations between changes in variables were examined

Findings

- 35 participants (14 LED, 21 UC), median BMI 38.6kg/m^2, eGFR 57mL/min/1.73m^2, urinary protein to creatinine ratio 84mg/mmol, completed the study.

Variable	Intervention group	Baseline	3 months	6 months
		Mean		
Weight loss (%)	LED	-	9.6	9.5
	UC	-	0.5	0.4
Adiponectin (µg/mL)	LED	12.6	8.1	10.8
	UC	10.8	10.4	8.8
Leptin (ng/mL)	LED	41.2	35.6	27.9
	UC	49.8	46.6	52.3
Adiponectin/Leptin ratio	LED	0.3	1.1	1.4
	UC	0.3	0.3	0.2
Fetuin-A (µg/mL)	LED	360.2	486.9	515.9
	UC	424.4	589.9	425.0
Urinary NGAL (ng/mL)	LED	119.1	135.5	74.9
	UC	127.7	147.2	73.1
Cystatin-C (mg/L)	LED	1.8	1.5	1.2
	UC	2.0	1.7	1.6

Table 1. Mean values of weight change and biomarkers in LED vs UC in at baseline, 3 and 6 months

At baseline

- *Leptin* was **high** (41.2 ± 27.7ng/mL), and *adiponectin* was **low** (12.6 ± 16.1µg/mL) across groups.

At 6 months

- Change in *leptin* was associated with weight (r=0.71, p<0.001) and waist circumference (r=0.57, p=0.001) changes.
- *Adiponectin/leptin ratio* **improved** in LED and remained **unchanged** in UC (p=0.45), and was **inversely** associated with weight loss (r=-0.49, p=0.008) and trended towards **positive** association with *fetuin-A* (r=0.42 p=0.08).
- Change in *fetuin-A* was **inversely** associated with change in *cystatin-C* (r=-0.59, p=0.008).
- *Urinary NGAL* was **unexpectedly inversely** associated with weight loss (r=-0.43, p=0.02).

Conclusion

Adults with obesity and CKD had **altered** leptin and adiponectin levels.

Intentional weight loss resulted in **favourable** changes in adiponectin/leptin ratio and fetuin-A, which was associated with reduced cystatin-C.

Findings demonstrate potential kidney-adipose tissue cross-talk mechanisms linking obesity and CKD.

Further studies are required to confirm this finding and examine potential mechanisms underlying this relationship.

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

THE IMPACT OF CLEARLY DEFINED DEBRIEFING PRACTICES ON NURSES WORKING WITHIN INTENSIVE CARE: A SYSTEMATIC REVIEW

Authors

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F Coyer [1]

S Keogh [2,3]

N Barker [1]

L Crowe [2]

Affiliations

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2 Royal Brisbane and Women's Hospital

3 Queensland University of Technology

OBJECTIVE

To explore the relationship between debriefing and wellbeing in the distinct population of registered nurses working in an adult ICU.

Imagine credits: istock photos

PURPOSE

There is clear division of opinion among researchers and clinicians on debriefing practices. Contemporary researchers report the overwhelming positive impact while historically others associate debriefing with ineffectiveness or harm. This division and the turbulent evolution of debriefing make it challenging to conceptualise debriefing utilisation within the ICU nursing population.

METHODS

All primary research, between 1st January 2004 and 9th May 2024 which explored a clearly defined debriefing process with an aim to improve wellbeing in the setting and population group of ICU nurses was considered.

A comprehensive search across multiple databases was performed, including APA PsycInfo, CINAHL Complete, PubMed and Embase. Google Scholar and reference lists were also searched.

THEME ONE:

MORAL DISTRESS SCORE

ONE STUDY reported statistical significance in the reduction of overall moral distress, as measured by the moral distress thermometer (MDT) ($p<0.001$).

THEME TWO:

THE IMPORTANCE OF BELONGING AND NORMALISATION OF EMOTIONS

This theme was expressed as the opportunity to connect with colleagues, an expressed sense of relief at discovering colleagues share similar concerns and emotions, and the reported benefit of case discussions and resulting emotions with colleagues.

THEME THREE:

CONTINUATION WITH DEBRIEFING

Participants in all included studies, unanimously reported they wanted debriefing to continue.

CONCLUSION

This systematic review illustrates a paucity of research available of debriefing practices and wellbeing in the ICU nurse population. There is a need to produce rigorous research methodologies and reporting standards in this field to ensure the effective use, implementation and evaluation of debriefing practices for the benefit of nurses and the vulnerable patients they care for.

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

Implementation of Performance-Based Testing of Functional Cognition by Occupational Therapists at STARS

Ms Shannon Scarff[a], Ms Kaitlyn Spalding[b], Doctor Emmah Doig[ac], & Ms Katherine Goodchild[ad]

[a]Surgical Treatment and Rehabilitation Service; [b]School of Health Sciences & Social Work, Griffith University; [c]STARS Education and Research Alliance; [d]Acquired Brain Injury Outreach Service

Background:

Standardised performance-based tests (PBTs) of functional cognition are an essential component of evidence-based occupational therapy (OT) services in the inpatient rehabilitation context but frequency of use can be low.

Aim:

Increase evidence-based use of standardised PBTs within usual occupational therapy practice at STARS

Method:

Using the Knowledge to Action Framework and Behaviour Change Wheel, STARS OTs (*N* = 18) were supported to identify barriers to PBT use and strategies to overcome them, which were implemented by the project team.

Results:

Barriers:

- Perceived inflexibility of standardised measures
- Inadequate resources
- Not knowing what PBTs are available
- Difficulty choosing, administering or interpreting PBTs.

Strategies:

- Created kits for 4x PBTs suitable to the service's clinical population (i.e. demographics, diagnosis, occupational goals)
- Created decision-making support tools
- Provided workshops & 1:1 support
- Developed iEMR autotext templates

Practice Change: 2 months after implementation,

- Clinicians reported increased knowledge, skills and confidence surrounding PBT use
- PBT representation in iEMR cognitive assessment encounters increased from 7% to 30%

Project made possible by a 2023 Metro North Health Swift Grant

Improving Access to Shared Consumer Experiences to Support People Across Their Laryngectomy Journey

Belinda Lehn, Clare Burns, Sarju Vasani, Rebecca Fichera, Charlotte Hockey, Brien Hands
Royal Brisbane & Women's Hospital

Introduction

Laryngectomy surgery (removal of the voice box) creates permanent lifestyle changes for patients, including neck stomal breathing and loss of natural voice. Comprehensive & timely pre-operative counselling is essential but challenging due to availability of patients and their families, particularly for those living in regional and remote areas.

Aim

To develop and evaluate an accessible and sustainable education resource for people undergoing laryngectomy surgery across their healthcare journey.

Methods

Stakeholder consultation involved :

- Consumers – 3 females & 4 males with laryngectomy & 1 female relative. Aged 49-80 years, 1-18 years post laryngectomy
- RBWH Staff - ENT surgeon, dietitian, speech pathologist, and physiotherapist.

Development of Resource

- Developed resource linking videos and a pre-operative booklet hosted on Metro North Health Internet page
- Stakeholders identified content to be included in online videos.
- Rosie's story – video contributed by Sir Charles Gairdner Hospital

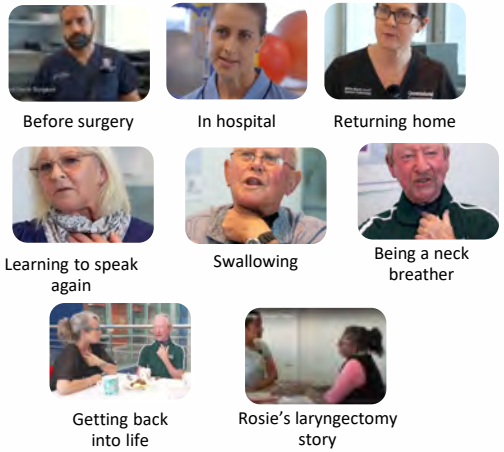
Evaluation of Resource

- Website Metrics: No. views, location of users, no. videos viewed.
- Online Survey: User ratings of video usefulness and benefits.

Results

Living with a Laryngectomy Online Resource

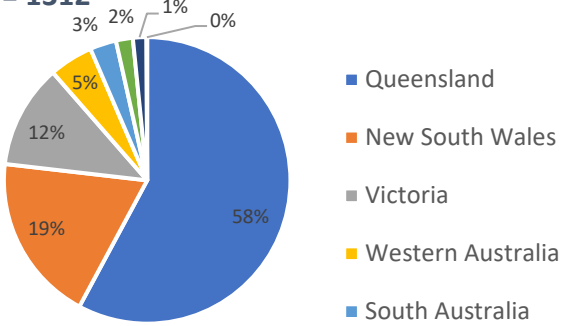
Eight informational videos



Website Metrics

Views across the world = 1603

Views across Australia = 1312



Survey Feedback

- 100% of respondents would recommend the resource.
- Over 90% found the videos helpful or very helpful.
- Common feedback highlighted the high quality, practical information, and ease of access.

Feedback from health professionals:

"information is very practical and it's often not written about in textbooks or journal articles but is so important for clinical management"

"diversity in age and gender gives a realistic cross-section of laryngectomy patients which is invaluable"

Feedback from patients and families:

"all the right information in one place, rather than trying to find things on internet"

"allows me to understand what is happening to my Aunt and how her new life will work"

"I learned that there is hope"

Contact

Visit Queensland Health – Laryngectomy or scan the QR code above

Belinda Lehn, Advanced Speech Pathologist RBWH. belinda.lehn@health.qld.gov.au

Acknowledgements: PAH Speech Pathology Department, Sir Charles Gairdner Hospital, CAHRLI Innovation Grant

Early Recognition of Reduced Limb Perfusion During Pelvic Exenteration Surgery using Near Infrared Spectroscopy: *A Case Report*

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Introduction

Pelvic exenteration surgery is a major complex surgical operation for patients with advanced pelvic malignancy. It involves multiple surgical specialties, and the average length of surgery is 11 hours, but may be up to 20 hours or longer[1].

Lower limb ischemia and compartment syndrome are rare but significant complications in patients undergoing pelvic exenteration surgery[2]. Risk factors include prolonged lithotomy position and leg elevation, intraoperative haemorrhage and volume loss, and vessel compression[2,3]. As a result of lack of access and lack of signs and symptoms, intraoperative recognition of reduced lower limb tissue perfusion and limb ischemia is often difficult.

Near infrared spectroscopy (NIRS) is a non-invasive method of monitoring tissue perfusion through observing superficial tissue oxygenation[4].

Case Description

A 54-year-old male undergoing elective pelvic exenteration surgery for rectal malignancy with sacral invasion, whose operation was complicated by reduced lower limb perfusion and ischemia. Early recognition using NIRS monitoring allowed successful and expedient management.

NIRS monitoring placed preoperatively → **Intraoperative loss of right leg perfusion on NIRS monitoring** → **Clinical correlation: ischemic pulseless right lower limb** → **Intraoperative balloon thrombectomy** → **Successful return of right lower limb perfusion**

- **Procedure length:** 20.5 hours.
- **Anaesthetic:** general anaesthetic with endotracheal intubation, preoperative combined spinal epidural.
- **Fluid balance:** 9.2 L estimated blood loss. Fluid and product resuscitation: 12.5 L of crystalloid, 7 L of colloid, 23 U of packed red blood cells, 2 U of fresh frozen plasma and 20 U of cryoprecipitate.
- **Monitoring:** standard pelvic exenteration procedure monitoring, with addition of NIRS placed preoperatively on the lateral aspect of bilateral lower limbs (over tibialis anterior) (*Figure 1*).
- **Positioning:** lithotomy, followed by prone, and supine once surgically possible.
- **Intraoperative:** reduced NIRS signal on the right lower limb indicating loss of perfusion (6.5 hours into the operation), prompting identification of clinically ischemic, pulseless right lower limb.
- **Management:** intraoperative thrombectomy of large right external iliac artery thrombus.
- **Outcome:** successful return of perfusion of right lower limb, and completion of operation.

Conclusion

NIRS is a non-invasive method of monitoring peripheral tissue perfusion that may have utility in the recognition of reduced lower limb perfusion during pelvic exenteration surgery.

Figure 1. Diagram of the positioning of NIRS sensors on the lower limb

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HERSTON HEALTH PRECINCT SYMPOSIUM 2024
2–4 September 2024
Education Centre, RBWH

Investigation of Blood-Brain Barrier transporter dysfunction in sporadic Alzheimer's disease: insights from patient IPSC-derived models

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Introduction

The blood-brain barrier (BBB) maintains brain homeostasis by regulating molecule entry, but its transporters can impede drug delivery and contribute to neurodegenerative diseases like Alzheimer's.

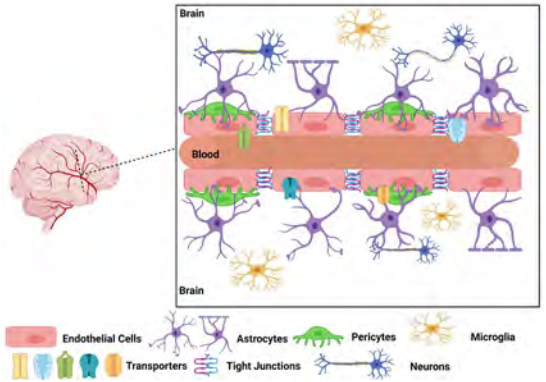

Figure 1: Schematic illustration of BBB and components in healthy brain

This study explores how BBB transporter activity is altered in sporadic Alzheimer's patients using human iPSCs derived from high-risk and low-risk individuals. The research involved examining BBB transporter expression in brain endothelial-like and astrocyte cells and testing a method to temporarily open the BBB for improved drug delivery.

Methodology

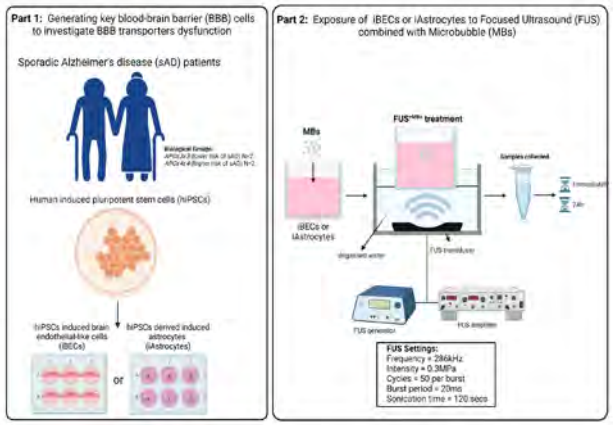

Figure 2: Overview of Cell Generation and Processing

Part 1: Cells were obtained from patients with two copies of the ε4 allele (high risk for sporadic AD) and those with two copies of the ε3 allele (control). Fibroblasts were reprogrammed into human induced pluripotent stem cells (hiPSCs), which were then differentiated into brain endothelial-like cells (iBECs) and induced astrocytes (iAstrocytes).

Part 2: iBECs and iAstrocytes were treated with focused ultrasound (FUS) and microbubbles (MBs) to temporarily open the BBB for enhanced drug delivery. Samples were collected immediately and 24 hours after treatment to analyze the expression of key BBB transporters and assess potential dysregulation in cells from sAD patients.

Results

hiPSC-derived BBB cells express key markers of the BBB

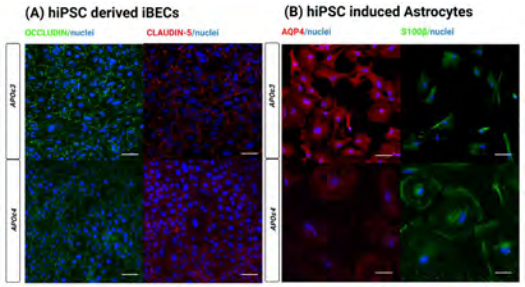

Figure 3: Protein Characterisation

Key BBB transporters are dysregulated in higher risk (APOε4) compared to lower risk (APOε3) sAD

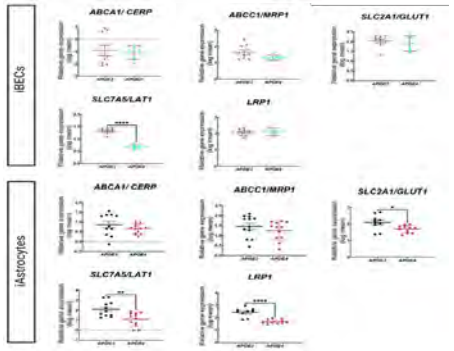

Figure 4: Relative gene expression characterisation

Effects of FUS treatment on gene expression of key BBB transporters in iAstrocytes vary between lower and higher risk sporadic Alzheimer's Disease (sAD) patients.

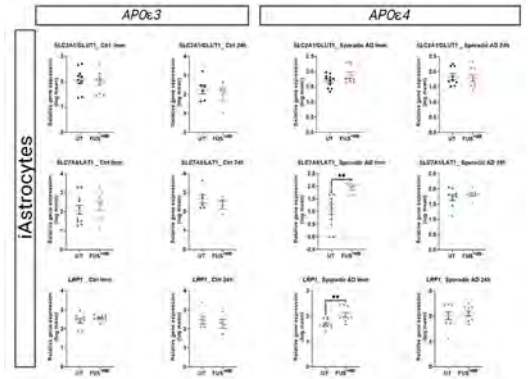

Figure 5: Effects of FUS on relative gene expression characterisation

Discussion

Our results revealed significant differences in BBB transporter expression between high-risk (APOε4) and low-risk (APOε3) sAD patients, particularly for transporters like LAT1 and GLUT1. After FUS+MB treatment, APOε4 iAstrocytes showed increased transporter expression compared to APOε3, despite initially lower levels in untreated samples, indicating a compensatory response. These findings underscore the utility of hiPSC-derived BBB models for studying sAD and evaluating therapeutic approaches like FUS for improving drug delivery.

Withdrawal from dialysis: 8-year experience in a Kidney Supportive Care Service

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Background

Withdrawal from dialysis is a common cause of death of dialysis patients[1] accounting for 28.5 % of all dialysis deaths in Australia in 2022.[2] Withdrawal from dialysis has increased over time potentially due to increasing, and often irreversible, comorbidities as well as access to kidney supportive care and palliative care services.[1]

Kidney Supportive Care (KSC) services have evolved to meet the palliative care needs of patients with chronic kidney disease, including dialysis patients who often have high mortality and symptom burden.[3] One of the key roles of KSC is to identify patients no longer benefiting from dialysis, facilitate withdrawal from dialysis, and end-of-life care planning.[3]

Understanding survival after withdrawal from dialysis is important for shared decision making around dialysis withdrawal and for planning end of life care.[4] A recent Australian study found that people lived a median of 4 days after withdrawing from peritoneal dialysis (PD) and 6 days after withdrawing from haemodialysis (HD).[4]

This study examines the profile and survival of patients known to a KSC service who withdrew from dialysis.

Table 1: Demographic characteristics

Age at time of death, median (IQR)	73.9 (68.7-79.8)
Gender, female, n (%)	67 (35%)
First Nations people, n (%)	7 (4%)
Median CCI at referral to KSC, n (IQR)	7 (6-8.5)
Presence of heart failure or IHD at referral to KSC, n (%)	62 (32%)
Presence of dementia at referral to KSC, n (%)	12 (6.2%)

Methods

Retrospective analysis of patients known to a KSC service who withdrew from HD or PD between February 2016 and May 2024.

Data extracted from hospital records were:

- Demographic (age, sex, ethnicity, treatment pathway, comorbidities) and Charlson Comorbidity index (CCI) at time of referral to KSC
- Reason for referral to KSC
- Patient choices including advance care planning (ACP) documents and preferred place of death were recorded.
- Date of dialysis withdrawal, date and place of death; and referral to palliative care services.

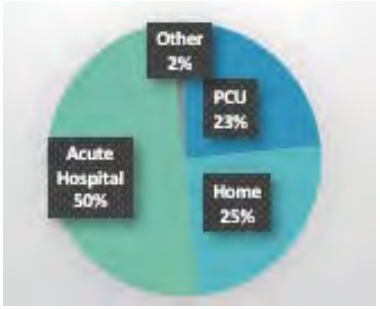

Figure 1: Place of death of patients withdrawing from dialysis

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Results

Over 8 years, 193 patients withdrew from dialysis, 165 from HD and 28 from PD. The median age at referral was 73.9 years and 35% were female (Table 1).

Patients withdrew from dialysis a median of 190 days (IQR 48-491) after KSC referral. 17% were referred to KSC in the last month of life.

The median survival after withdrawal from dialysis was 6 days (IQR 3-10). For withdrawal from HD the median survival was 6 days (IQR 3-10) and for PD was 3 days (IQR 1.25-9.75), however this was no significantly different (p=0.168). 6.2% survived more than 1 month following withdrawal.

49.7% of people died in hospital, 24.9% at home and 23.2% in a palliative care unit (Figure 1).

80 (41.5%) people had indicated a preferred place of death. Of these, 52.5% died in the place of their choosing.

- 38.1% who wanted to die at home did
- 61.1% who wanted to die in a palliative care unit did
- 75% who wanted to die in an acute hospital did.

Conclusions

Our results indicate that patients survive less than a week after withdrawal from dialysis, which is consistent with current literature.[4] Most patients died in acute care settings, which was often not in keeping with their wishes. This may have been due to acute medical complications or sudden deterioration limiting transfer to their preferred place of death.

Anecdotally, survival following withdrawal from PD is longer than HD, however, this was not the case in our cohort. This may be again may be due to sudden physical deterioration.

Further work and service development is needed to understand how best to provide care that concords with end-of-life preferences.

Case Report: Hemosuccus Pancreaticus - A Delayed Diagnosis

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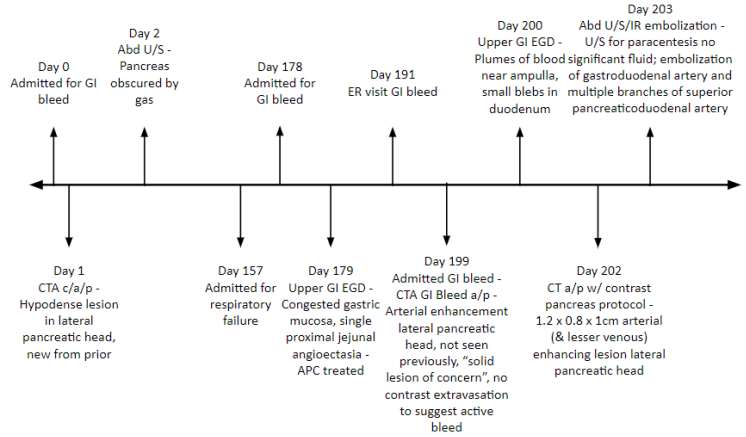
Introduction

Hemosuccus pancreaticus (HP) is a potentially life-threatening condition characterized by hemorrhage into the pancreatic duct system. HP hemorrhage usually results from the rupture of pseudoaneurysms in the peripancreatic arteries, which are frequently caused by pancreatic trauma or chronic pancreatitis. Patients with HP often present with symptoms of upper gastrointestinal bleeding. The so-called Bernard triad of abdominal pain, a pancreatic mass, and gastrointestinal bleeding may be present in some cases. However, the presentation can vary widely, and the diagnosis is often challenging due to its rarity and nonspecific symptoms.

Case Presentation

The case was of a 69 year old male who presented with hematochezia and severe epigastric pain with nausea. This patient suffered a GI bleed and was hospitalized in October, and a hypodense lesion was noted in the pancreatic head, new on CTA Chest/Abdomen/Pelvis (C/A/P) at this time. No follow up was performed except an abdominal ultrasound, where the pancreas was not visualized due to gas. He was admitted the following April for another GI bleed due to a jejunal angioectasia found on esophagogastroduodenoscopy (EGD), with no further abdominal imaging.

Timeline of Events



Case Progression

Upon readmission for hematochezia in May, a CTA A/P with gastrointestinal bleed protocol described the same pancreatic lesion as arterial enhancement of the pancreatic head not seen previously, and a "solid lesion of concern." A CT A/P with contrast and pancreas protocol described the same 1.2 x 0.8 x 1cm arterial enhancing lesion. It was not until the interventional radiology team was involved that diagnosis of HP was entertained and later confirmed status post embolization.

Discussion

This case underscores the critical need for heightened clinical awareness of hemosuccus pancreaticus (HP), a rare but potentially life-threatening cause of gastrointestinal bleeding. Due to its rarity and nonspecific symptoms, the diagnosis of HP is often delayed, as seen in this 69-year-old male who experienced repeated gastrointestinal bleeds and persistent abdominal pain over several months. The change in the appearance of the pancreatic lesion on imaging—depending on whether the pseudoaneurysm was thrombosed or actively hemorrhaging—further complicated the diagnosis. This report emphasizes the importance of considering HP in the differential diagnosis of unexplained GI bleeding, particularly when imaging findings evolve, to prevent prolonged patient suffering and complications.

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Neonatal and device characteristics: a case series of recurrent reinsertion

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BACKGROUND

Insertion of neonatal peripheral intravenous catheters (PIVCs) can be difficult, requiring multiple attempts, and each attempt causes pain and delays treatment (*Figure 1*).

AIM: To describe the clinical characteristics of neonates requiring multiple PIVCs.

METHOD

Case series of neonates requiring 3 or more PIVCs

- Admission to an RBWH between October 2020 and February 2021.
- Characteristics collected second daily
  - Patient (weight, gestational age, acuity)
  - Device (treatment indication, location).
  - Device outcomes (completion of treatment or failure)

Figure 1 – PIVC insertion site

RESULTS

In total, 19 of 248 (8%) neonates received three or more PIVCs (n=101 PIVCs). One neonate required 12 PIVCs. Neonates were admitted to ICU (100%). Median gestation and weight were 26.6 weeks (interquartile range [IQR] 24.6-28.6 weeks) and 728 grams (IQR 640-1050g).

PIVC were placed mostly in the hand (42%, n=42). The median dwell time was 49 hours (IQR 35.0-73.5 hours), with a maximum dwell of 263 hours. Most PIVCs (57%, n=58/101 PIVCs) failed with complications (*Figure 2*), and 9% (n=10) of all devices were inserted prior to the removal of the previous device (*Figure 3*).

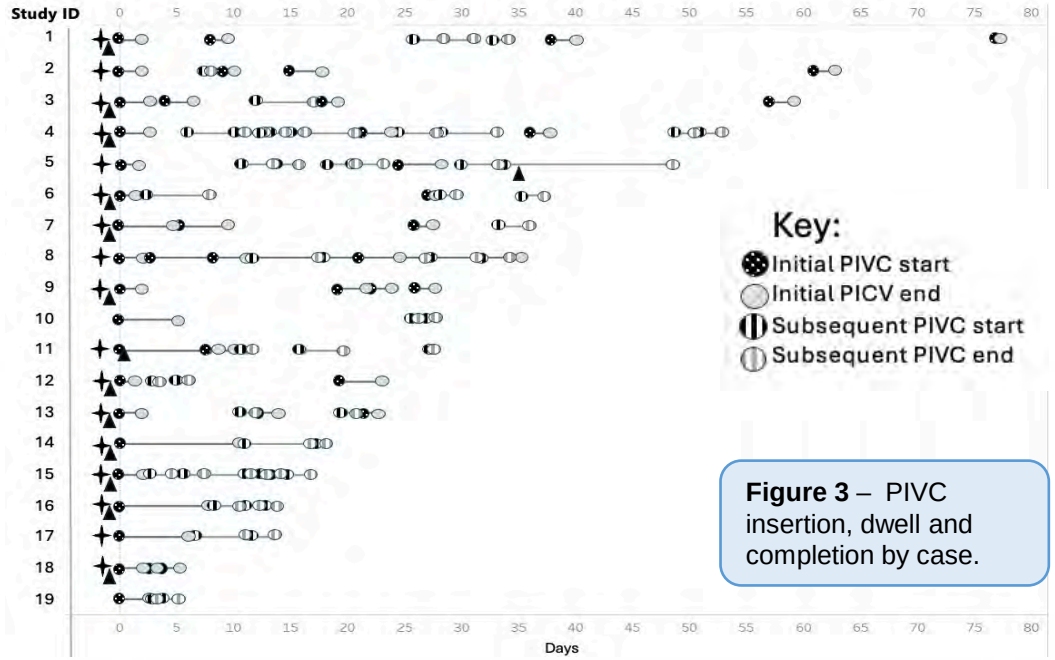

Figure 3 – PIVC insertion, dwell and completion by case.

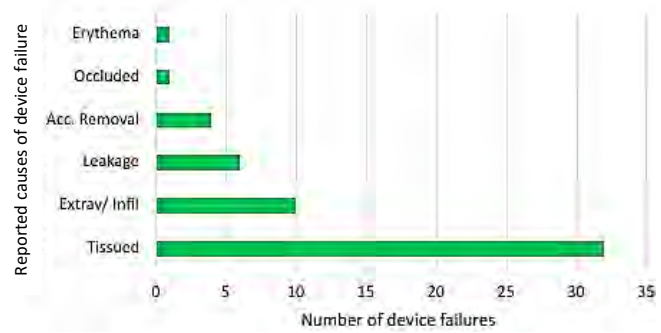

Figure 2 – PIVC failure cause (n=58)
Acc. Removal= Accidental removal, Extrav/ Infil= Extravasation/ Infiltration

CONCLUSION

Despite perceptions that larger babies' PIVCs fail, extremely low birthweight babies often required frequent re-cannulation, with many PIVCs failing prior to treatment completion. Further investigation is needed for decision-making, advanced inserter skills, and optimisation of alternate vascular access device selection for this vulnerable population.

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

“A banana in the tail pipe”: Study on Patient Flow in Queensland’s public hospitals

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Clair Sullivan, Mahnaz Samadbeik – The University of Queensland
Andrew Staib, James Lind – Queensland Health
Emma Bosley – Queensland Ambulance Service

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Study purpose:

To establish an evidence base for factors leading to access block and inform strategies to improve emergency access performance across Queensland.

Methods: Qualitative + Quantitative approach sense-checked by clinicians for translation:

- A literature review to provide a comprehensive and up-to-date summary of the challenges impeding patient flow in the ED and an evidence-base regarding patient flow interventions.
- Globally-novel spatial modelling of factors upstream and downstream of hospitals (e.g. primary care coverage, aged care places) affecting ED demand and access block.
- Robust statistical modelling of all stages of the patient journey based on every ambulance attendance, ED presentation, inpatient episode of care, and ward transfer movement across Queensland’s public hospitals over 6 years (a national first in scrutinising whole-of-system patient flow to this degree).
- Cutting edge simulation (e.g. early discharge timing, removing Maintenance Care episodes, throttling back electives, increasing admissions on the weekend etc.) to quantify the magnitude of impacts of actionable strategies to improve access to emergency hospital care.
- Focus groups with patients and healthcare workers to offer a cross-sectional view of the experiences and opinions of service providers and patient consumers.
- A key set of findings and recommendations that support the development of solutions that are practical and actionable.

Results: Recommendations to policymakers are based on synthesis of the literature review, quantitative analysis and qualitative focus groups:

- introduce inpatient discharge metrics and monitoring to shift focus from the front door of hospitals to the “back door”.
- increase support for primary care, community care, aged care, NDIS and vulnerable groups.
- maintain demand-side strategies such as increased provision of inpatient-equivalent care alternatives such as hospital in the home and acute care within nursing home services.
- invest in prehospital flow, e.g. community paramedicine and paramedic practitioner roles
- improve hospital processes such as extended-hour inpatient discharge lounges & additional inpatient beds and ensure adequate resourcing to provide true inpatient capacity increases.
- improve workforce for the expected growth in demand, especially accredited nursing roles in regional areas, prehospital care, hospital roles including allied health, mental health, social work, and aged care
- revise funding policies to be based on patient outcomes rather than service volume.

Conclusions: Like the ailing canary in the coal mine, ED crowding is a symptom of health care system dysfunction. Without action, patients will continue to be at a heightened risk of harm.

Digital Readiness for Pharmacy Staff – A Baseline Survey

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1. RBWH | 2. Caboolture Hospital

Aim:

To establish pharmacy staff sentiment in transitioning to a digital system, perceived 'digital readiness', benefits, and challenges at two Metro North hospital sites.

Methods:

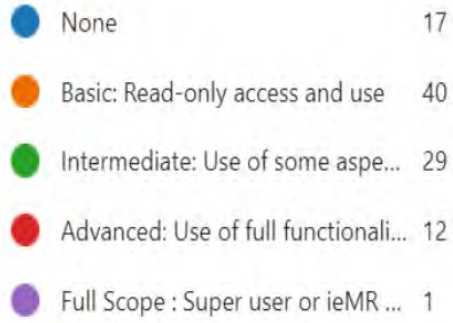
Cross-sectional survey of pharmacy staff over 2 ½ week period

Likert-style, multiple-choice and open questions explored the following:

- Baseline experience with the system
- Perceived individual + departmental digital readiness
- How to improve perceived digital readiness

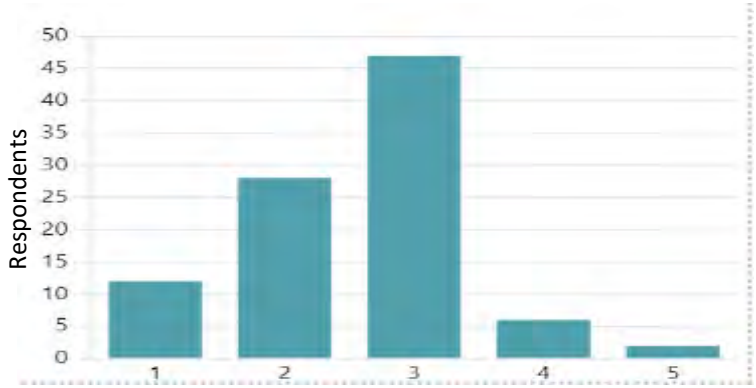
Results:

Baseline Level of Experience with ieMR:



Individual ieMR Readiness: Average response*: I feel somewhat ready, have some familiarities with the system but do not understand how this will change workflows*

Departmental ieMR Readiness:



1:Not ieMR ready
3. Somewhat ieMR Ready
5.ieMR Ready

57% of respondents indicated the department was ***somewhat ieMR ready***

Recommendations:

This study identified key themes to assist with digital readiness

- Early **education and training**
- Access to digital **training material**.
- Visibility/understanding of digital **workflow change**
- **Information Technology access**
- Digital Subject Matter Expert support/presence

Conclusions:

The results will assist with **early adoption of digital systems** and provide a focused agenda for managers at transition sites when engaging with project teams and vendors through the implementation process.

Development and Implementation of the Metro North Adolescent & Young Adult Kidney Clinic

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Background

Adolescents and young adults (AYAs) with kidney disease are recognised as a group at higher risk of losing kidney function, particularly as they transition from paediatric to adult healthcare.[1-4]. The literature tells us differentiated care that is developmentally and age-appropriate delivers better health and, by extension, wellbeing outcomes to this patient population.[5-9]

Aims

The project aimed to **address the need for youth specific kidney services** by:

- Co-producing an AYA Kidney Model of Care with clinicians, consumers and subject matter experts.
- Implementing a dedicated AYA kidney clinic in 2022.

Methods

The establishment of **formal project governance**, with strong and active representation from key internal and external stakeholders.

A **consumer recruitment** process to understand the experiences and priorities of AYA with kidney disease.

A **Model of Care Working Group**, with consumer representation, local multi-disciplinary clinical representation and subject matter experts from across Australia.

An **As-Is analysis** of current service provisions and a profile of the patient population.

An **Implementation Working Group** to guide the implementation of the model into service delivery to patients.

An **Evaluation Working Group** to develop the evaluation framework and deliver an evaluation report.

Results

An endorsed model of care

A model of care for young people with kidney disease was co-produced by the working group through an iterative series of three facilitated workshops and endorsed by leadership.

The model of care includes a **vision statement**, evidence review, As-Is Analysis and sets out the principles and key features of AYA kidney care in Metro North.

Vision for kidney AYA care in Metro North

All AYAs with kidney disease will have access to developmentally appropriate and culturally safe quality AYA care, delivered in partnership with the young person and their family by appropriately trained multidisciplinary healthcare professionals.

Key features of the model of care

* This project was made possible with support from Transplant Australia and the Sony Foundation – through the provision of a youth worker - to implement the Oxford-London model.[5]

Implementation of an adolescent and young adult clinic

The pilot AYA clinic was established at a community health centre in September 2022 and held for a half day every two months.

- The pilot clinic was staffed by a nephrologist, transplant clinical nurse consultant, renal pharmacist and Transplant Australia* youth worker.
- Patients participate in youth worker led activities in the AYA waiting room.
- The clinic grew to capacity (n=12 attendees) within 4 clinics.
- Clinic attendees were at varying stages of kidney disease management including dialysis (50%) and kidney transplantation (31%).

Patient reported experience measures

Overall patients have reported a positive experience at the clinic, with:

- 89% agreeing the clinic motivates them to engage in their healthcare.
- 78% strongly agreeing they would recommend the clinic to other AYAs with kidney disease.

Conclusion

The high levels of patient engagement and positive feedback supports the need for a dedicated AYA kidney clinic. The co-design process for developing the model of care was essential to the change management process and ensured the new service was person-centred. The medium- and long-term impacts of the model on health outcomes and system costs will continue to be measured and reported as part of the evaluation.

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POPULATION PHARMACOKINETICS OF OLANZAPINE AND QUETIAPINE IN CRITICALLY ILL ADULTS WITH DELIRIUM

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INTRODUCTION. Acute delirium is a common and serious condition in critically ill patients. However, there is no consensus on the optimal drug or dosage for its treatment due to a lack of data on antipsychotics in this patient population. Critically ill patients often have altered pharmacokinetics (PK), complicating the administration of these medications. The lack of PK data is particularly concerning as it is very challenging to determine clinical efficacy when using antipsychotic drugs in delirious patients in ICU. **This single-centre prospective observational substudy aimed to characterise the population PK parameters of oral olanzapine and quetiapine in adult critically ill patients with delirium.**

METHODS. Blood samples were collected at 6 and 24 h post-dose or immediately before the next dose for olanzapine, and at 1.5, 5, and 12 h post-dose or immediately before the next dose for quetiapine. For patients continuing the medication, additional trough samples were drawn at 24, 48, and 72 h after the initial trough event. Total plasma concentrations were measured using UPLC–MS/MS.

Population PK analysis was conducted using NONMEM® 7.5.1 with the first-order conditional estimation with interaction (FOCE+I) method.
Covariates screened included age, weight, albumin, bilirubin, international normalised ratio, and sex. For olanzapine, smoking status and concurrent use of fluvoxamine, sertraline, or valproate were evaluated. For quetiapine, concurrent use of erythromycin was assessed. Model evaluation was based on goodness-of-fit (GOF) plots and prediction corrected visual predictive check (pcVPC). Final models were validated through bootstrap analysis (n=1000).

RESULTS. Twenty-seven patients (85% male, mean ±SD age: 49 ±15 years, weight: 91 ±18 kg) contributed 96 samples.

- Median (min–max) olanzapine concentration at 6 h post-dose was 10.1 (2.7–32.2) ng/mL. For quetiapine, concentration at 1.5 h post-dose was 201.9 (72.9–693.2) ng/mL.
- Both models incorporated first-order absorption and linear elimination, with exponential interindividual variability (IIV) and proportional residual error.
- No covariates were retained in either final model.
- The GOF and pcVPC plots indicated acceptable fitting.
- The mean estimated parameters closely aligned with the median of the corresponding bootstrapped parameters and fell within their respective 95% CI, demonstrating the stability of both models.

Table 1. Parameter estimates of the final population PK models of olanzapine and quetiapine with corresponding bootstrap results

OLANZAPINE		
One-compartment model (n= 11 patients, 36 samples)		
Parameter	Estimates (RSE) [Shr.]	Bootstrap median (95% CI)
CL/*F* (L/h)	19.7 (28%)	20.2 (8.9–31.7)
Vc/*F* (L)	1080 (18%)	1073 (760–1522)
KA (h^{-1})	0.49 FIX	0.49
Interindividual variability		
IIV_CL (CV%)	70.8 (27%) [18%]	61.5 (22.9–112.8)
IIV_V (CV%)	39.6 (21%) [20%]	36.6 (17.3–69.6)
Residual error		
Proportional (CV%)	21 (0%) [20%]	20.5 (10.5–30.4)

QUETIAPINE		
Two-compartment model (n= 16 patients, 60 samples)		
Parameter	Estimates (RSE) [Shr.]	Bootstrap median (95% CI)
CL/*F* (L/h)	24.8 (16%)	24.3 (18.4–34.0)
Vc/*F* (L)	34.7 (25%)	33.8 (18.3–58.1)
Q/*F* (L/h)	18.4 (22%)	16.9 (6.1–27.4)
Vp/*F* (L)	69.9 (23%)	67.2 (27.1–104.3)
KA (h^{-1})	0.345 (16%)	0.339 (0.179–0.466)
Interindividual variability		
IIV_CL (CV%)	67.4 (14%) [2%]	61.5 (43.8–85.3)
Residual error		
Proportional (CV%)	25.4 (0%) [12%]	24.2 (17.7–30.1)

RSE, relative standard error; Shr, shrinkage; CI, confidence interval; CL/*F*, apparent oral clearance; Vc/*F*, apparent central volume of distribution; Q/*F*, apparent intercompartmental clearance; Vp/*F*, apparent peripheral volume of distribution; KA, first-order absorption rate constant; CV% of variability calculated as $\sqrt{\omega}*100$.

CONCLUSION. HIGH VARIABILITY IN DRUG CLEARANCE WAS OBSERVED. ONGOING DATA COLLECTION WILL FURTHER IMPROVE MODEL PERFORMANCE AND BE USED TO SUPPORT PROPOSAL OF OPTIMISED DOSING REGIMENS.

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

Evaluating Patient and Carer Satisfaction with a Kidney Supportive Care service

Catriona Bisset[1], Louise Purtell[1,2], Laura Austin[1], Kirsten Hepburn[1], Ann Bonner[1,2], Ilse Berquier[1], Helen Healy[1], Katrina Kramer[3].
[1]Kidney Health Service, Metro North Hospital & Health Service, Brisbane, QLD; [2]School of Nursing and Midwifery, Griffith University; [3]Palliative & Supportive Care Service, Royal Brisbane & Women's Hospital, Brisbane, QLD

KIDNEY SUPPORTIVE CARE

The Kidney Supportive Care (KSC) service has a person-centred approach to care for those living with advanced kidney disease.

Patient satisfaction is an important and commonly used indicator for measuring quality in healthcare.

PURPOSE

We aimed to evaluate the patient and carer experience in an outpatient KSC clinic setting.

METHODS

- An anonymous 6-item survey was used. It included:
  - 2 general information items
  - 3 Likert items
  - 1 free text item to elicit qualitative feedback
- The survey was offered to each patient/carer after attending a KSC clinic
- Data collected between October 2023 and January 2024
- Data were analysed descriptively.

RESULTS - QUALITATIVE FEEDBACK

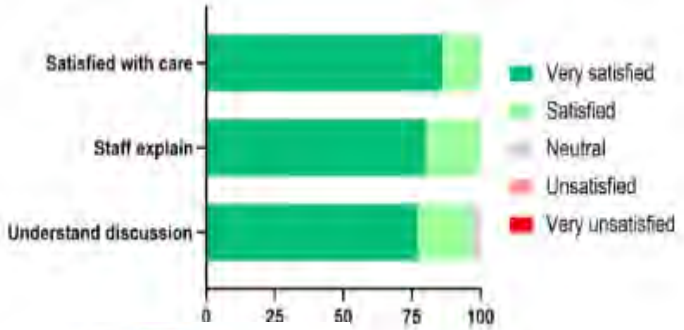
Qualitative feedback from consumers included comments such as finding the team to be helpful and displaying gratitude for the conversations held in clinic.

Improvement suggestions included the idea of conducting a home-based KSC service.

- 34 surveys were returned
- 91% of respondents (n=31) were patients
- 38% of respondents had been attending the KSC clinic for 12 months or longer
- 100% of respondents either agreed or strongly agreed that:
  - ✓ They were satisfied with the healthcare provided by the KSC service
  - ✓ Staff explained things in a way that was easy to understand
  - ✓ They had left the appointment with a clear understanding of the discussions and about their future care.

CONCLUSIONS

Overall, respondents were extremely satisfied with the care provided and valued discussions around goals of care.
Feedback will continue to be solicited to ensure that service delivery is meeting consumer needs.



"Feel safer coming here. Learnt more about myself with the conditions I have".

"Very patient and understanding. Expert knowledge of specialised area"

"Friendly, professional staff. Very informative conversations. Always answered my questions concisely. Listened to all my concerns and addressed them".

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

Snapshot Audit of Non-formulary Medicine Usage and Expenditure

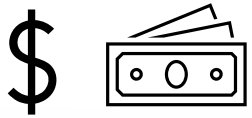
David Bagshaw[1], Panteha Voussoughi[2], Elizabeth McCourt[2,3], Sahra Ashley[2], Brett Sweeney[2], Peter Donovan[2]

1. QUT |2. RBWH | 3. Centre for Clinical Research, UQ

Purpose:

- Queensland Health (QH) has a state-wide medicines formulary – list of approved medicines (LAM)
- QH Prescribers are asked to use LAM
- Queensland Health medicines advisory committee (QHMAC) advises that non-formulary medicine (NFM) usage should be <10% of total medicine usage and cost
- RBWH is reported to be between 13-18%

Objective:

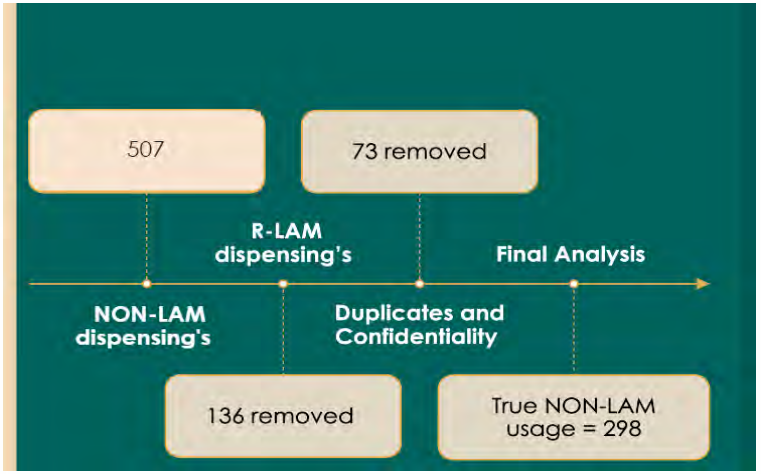


Actuals vs Reported

Quantify the proportion of NFM usage and expenditure at RBWH and compare with that of reported usage.

Actions:

- Retrospective cross- sectional audit of NFM over a two-week period in April 2024
- Dispensing software was used to generate NFM dispensing
- Data was analysed using descriptive statistics
- NFM usage was compared with reported usage.



Results:

After data cleaning only 298 items remained. Of these 72 (24%) had been approved for individual patient use, 125 (42%) had prior approval in place for a specific condition/by a specific team, and 101 (34%) did not have approval.

Usage Rates

	Usage	Percentage
Reported	1037	13.94%
Actual	298	3.29%
Difference	739 less disp	-10.65%

Cost

	Cost	Percentage
Reported	$252,000.285	13.8%
Actual	$56,282.29	1.5%
Difference	-$195,717.995	-12.3%

Conclusions:

- Analysis of NFM report is extremely limited in capacity to show actual usage and cost.
- This audit provided a better reflection of NFM usage and will be used to inform practice change in the approvals processes.

Exploring the effect of low energy diets on risk factors & markers of kidney disease: Findings from the slowing kidney disease with weight loss feasibility study

M. CONLEY [1,2], K. HEPBURN[3], H.L. MAYR[1], D. W. MUDGE[1], J. HOLLAND[2], D.W. JOHNSON[1], A.K. VIECELLI[1] and H. L. MACLAUGHLIN[2,3]

1. Princess Alexandra Hospital, Brisbane, Australia. 2. School of Exercise and Nutrition Sciences, Queensland University of Technology, Brisbane, Australia. 3. Royal Brisbane and Women's Hospital, Brisbane Australia.

Background

- Whether weight loss can delay or prevent the progression of obesity-associated CKD, and the amount of weight loss that may confer such benefit have not been well-established.
- **Aim:** This feasibility study explored kidney disease risk factors and markers of kidney function in a six-month randomised controlled trial.

Method

- 49 adults from Brisbane Australia, with stages 1-3b CKD + BMI ≥30kg/m^2 + proteinuria, randomised (1:1)
- **LED group =** 3-month LED with meal replacements and low-calorie foods, + dietitian support, followed by 3-month maintenance phase (healthy eating + exercise support).
- **Usual care group** = Optional weight loss support through usual kidney clinic.
- Changes in CKD risk factors and kidney markers were examined.

Results

- 38 adults (78%), median age of 56 years, eGFR 57 mL/min/1.73m^2 and BMI 39kg/m^2 completed the study.
- At 6 months, significant intervention effects were observed for weight (WT) and waist circumference (WC) but not for urinary protein to creatinine ratio (uPCR), systolic blood pressure (SBP), diastolic blood pressure (DBP) or estimated glomerular filtration rate (eGFR) measures (Table 1).
- There was large variability across eGFR measures.

Variable	Change score 0–6-month Median (interquartile range)		
	LED (n=16)	Usual Care (n=22)	p-value
WT (kg)	-9 (-12, -7)	0 (-4, 2)	<.001
WT (%)	-8 (-12, -6)	0 (-3, 2)	<.001
WC (cm)	-10 (-13, -6)	-3 (-5, 2)	.002
SBP (mmHg)	-7 (-13, 1)	-1 (-9, 11)	.300
DBP (mmHg)	-3 (-5, 0)	1 (-3, 5)	.120
uPCR (g/mol)	-7 (-110, 19)	- 4 (-44, 34)	.330
eGFR			
CKD-EPI CR^ mL/min/1.73m^2	4 (1,7)	-2 (-6, 4)	.056
CKD-EPI CR^ (BSA) mL/min	4 (2, 6)[a]	-2 (-7, 5)[b]	.187
CKD-EPI C-C# mL/min/1.73m^2	11 (0, 35)[c]	7 (-2, 20)[d]	.245
CKD-EPI C-C# (BSA) mL/min	14 (-1, 44)[e]	8 (-1, 25)[f]	.371

^CKD Epidemiology Collaboration Creatinine equation (2009)
#CKD Epidemiology Collaboration Creatinine-Cystatin C equation (2021)
BSA; un-indexed using actual body surface area at each time point
Excludes eGFR >120ml/min/1.73m^2 , [a]n=12; [b]n=20; [c]n = 13; [d]n = 17; [e]n = 12; [f]n = 16

Table 1. Changes in risk factors and markers of kidney function, following six-month weight loss program.

Conclusion

- Low energy diets can significantly reduce body weight and waist circumference and may lead to improvements in eGFR, proteinuria and systolic blood pressure.
- Interpreting estimates of kidney function remains challenging.
- Longer and larger trials exploring the use of LEDs on risk factors and measures of CKD progression are warranted.

Figure 1. Sample LED plan consisting of a combination of meal replacement and low energy food items

Scan here for study primary outcomes results

Acknowledgements

- Kidney Health Australia Research Grant

Contact: marguerite.conley@health.qld.gov.au

A Human Factors Approach to Comprehensive Medical Device Evaluations

Rebecca Wang[1], Kirsty McLeod[1], Mia McLanders[1], Jasmine Antoine[1,2]

Background

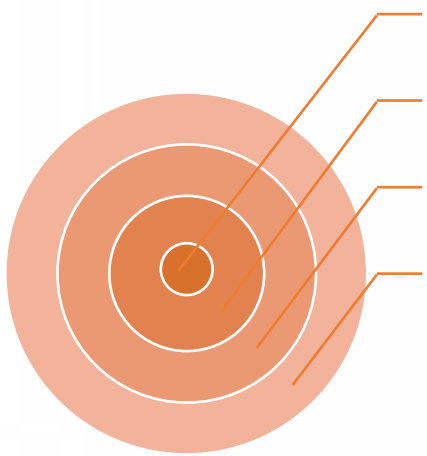
- Safe, usable, and functional medical devices and clinical processes are essential for effective clinical performance and patient outcomes.
- Procurement of medical devices and the design of clinical processes in hospital and health services often rely on limited, subjective evaluations.
- This highlights a need for a more rigorous, evidence-based approach to evaluation.

Human Factors Approach

- The CSDS Usability Lab takes a Human Factors and user-centred approach to the evaluation and the design of medical devices and clinical processes.
- This approach examines interactions between people, tools and equipment, tasks and processes, and environmental factors.
- The Lab provides a controlled, simulated environment to support clients in evaluating medical devices and clinical processes, including:

Summative evaluations	Comparing existing medical devices and processes to inform evidence-based decision-making.
Formative evaluations	Testing prototype medical devices and processes to improve design.

Human Factors Framework



People (Clinicians and Consumers)

Physical, Cognitive, Psychological, Demographics

Tools and Equipment

Physical, visual, or cognitive tools

Tasks and Processes

Workload, order, competing demands, training

Environment

Lighting, sounds, temperature, layout, culture, policies, management, resources

Examples of Measures and Techniques

Physiological responses	Psychomotor tests	Psychological responses	Attention
• ECG, EEG, EDA	• manual dexterity	• stress, anxiety	• eye-tracking

Technical performance	Behavioural observations	Questionnaires and interviews	Self-report measures
• time on task, error rate	• teamwork, communication	• conducted before or after the simulation	• the talk-aloud protocol, the subjective usability scale

Value and Outcomes

- The framework allows for objective and comprehensive evaluations of medical devices and clinical processes.
- Simulation-based evaluations enable us to identify barriers and enablers to effective clinical functioning, and contribute to:

Usability and Safety Improvement

Clinical Performance and Customer Experience

Research and Knowledge Enhancement

Project Examples

Examples of ongoing and completed projects led by or involving the CSDS Usability Lab:

- ✓ Telehealth vs head-worn AR devices for rural and remote support
- ✓ Transition from traditional to video laryngoscopes
- ✓ Identifying key factors contributing to unplanned extubation of neonates
- ✓ Using a Human Factors approach to redesigning proning pillows in the ICU

Affiliations

1. CSDS Metro North
2. Mater Mother's Hospital

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

Developing an interprofessional dietetics and speech pathology clinical assistant intervention for mealtime optimisation for STARS inpatient services

Lauren Wright[1], Rachel Levine[1], Kylie Short[1] & Amanda Adams[2]

[1] Speech Pathology & Audiology, Surgical Treatment and Rehabilitation Service (STARS), Metro North Health
[2] Dietetics & Food Services, Surgical Treatment and Rehabilitation Service (STARS), Metro North Health

Background

Patients with communication disorders are at a higher risk of malnutrition and require increased support with meal ordering.

Working with interprofessional clinical assistants (IPCAs) is an efficient and effective service delivery model.

Delegation resources are needed to support the implementation of an IPCA role for meal ordering optimisation.

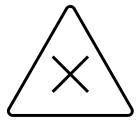
Project Aim

To **develop and pilot a package of delegation resources** for a speech pathology & dietetics IPCA role for meal ordering optimisation for patients with communication deficits.

Methods

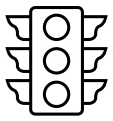
1. Establish IP working group
2. Surveys regarding barriers and facilitators to the role
3. Develop resources to address barriers
4. Pilot training package and resources with CAs
5. Evaluate training and resources via surveys and focus groups
6. Finalise package & plan for role roll-out

Results



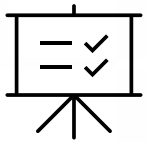
IPCA Role Barriers

Time constraints
Staffing
Existing workflows



IPCA Role Facilitators

Resources
New workflow
Staff training



Training Package Developed

Training workshop
Delegation framework
Therapy resources
Documentation templates

Package Evaluation

Staff reported increased:
- Knowledge
- Skill
- Confidence

All staff viewed the role as being valuable for patients

"The patient is going to be able to get some control back in their life, being able to choose what they want. It'll be wonderful."

"I think having time for them [patients with communication deficits] to pick something that they are more likely to have will improve their intake."

Conclusion & Future Directions

A full suite of delegation and training resources were developed to support a speech pathology & dietetics IPCA role.

Outputs from this project will support future implementation of the IPCA meal ordering optimisation role at STARS.

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

Saliva and Plasma-Derived Small Extracellular Vesicles: promising prognostic biomarkers for head and neck cancer

Abolfazl Jangholi [1], Liz Kenny [2], Sarju Vasani [2], Omar Breik [2], Sudha Rao [3], Riccardo Dolcetti [4,5], and Chamindie Punyadeera [1]

[1] Griffith University, [2] Royal Brisbane and Women's Hospital, [3] QIMR Berghofer Medical Research Institute, [4] The University of Melbourne, [5] Peter MacCallum Cancer Centre

Introduction

- Head and neck cancers (HNC) are highly immunosuppressive and 20-50% of HNC patients experience relapses.
- Small extracellular vesicles (EVs) contain cancer-derived biomolecules that can mediate cancer progression and metastasis.
- Saliva and plasma small EVs could serve as minimally invasive prognostic biomarkers for HNC.

Methods

- Saliva and plasma small EVs were isolated from HNC patients with and without recurrence.
- Small EVs were characterised using nanoparticle tracking analysis (NTA), Cryo-transmission electron microscopy (TEM), and western blotting (WB).
- The protein cargo of salivary and plasma small EVs was unravelled using SWATH mass spectrometry (Fig 1).

Results

- No significant differences were observed in the size and concentration of small EVs between the two cohorts of patients (Fig 2).
- a comparative proteomic analysis was conducted, and volcano plots of all proteins were generated (Fig 3).
- Recurrent patients exhibited a lower abundance of proteasome subunits in their salivary small EVs (Fig 4. A).
- Plasma small EVs derived from recurrent patients contained elevated levels of proteins involved in the invasion and migration of cancer cells (Fig 4. B).

Conclusion

- Salivary small EVs revealed that antigen processing is less effective in patients with recurrence, resulting in less efficient recognition of cancer cells.
- Plasma small EVs can enhance the adhesion of tumour cells to platelets which helps the metastatic cells survive in blood circulation.

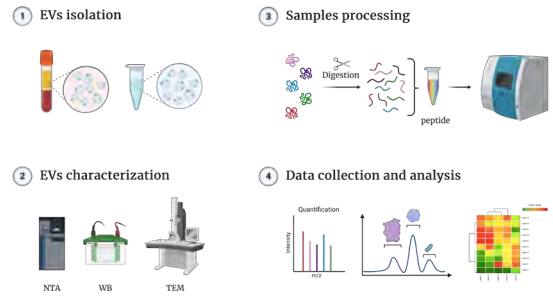


Fig 1. Schematic overview of the study's workflow: Small EVs were isolated from the saliva and plasma of HNC patients and assessed using NTA, WB, and TEM to determine their size, concentration, markers, and morphology. To identify biomarkers predictive of recurrence in HNC patients, a comparative proteomic analysis was performed using SWATH-MS.

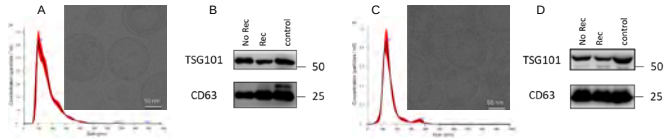


Fig2. The size and morphology of (B) saliva and (D) plasma small EVs were characterized using nanoparticle tracking analysis and Cryo-transmission electron microscopy, respectively. Immunoblotting for TSG101 and CD63 markers of small EVs isolated from (B) saliva and (D) plasma samples.

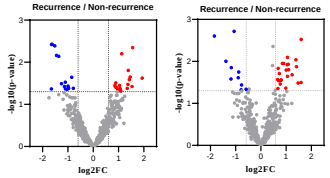


Fig 3. Volcano plot identifying proteins from (A) saliva and (B) plasma small EVs by their log2-fold changes against their corresponding adjusted p-value in patients with and without recurrence. There were 33 and 38 significantly differentially abundant proteins in saliva and plasma small EVs, respectively, distinguishing between patients with and without recurrence.

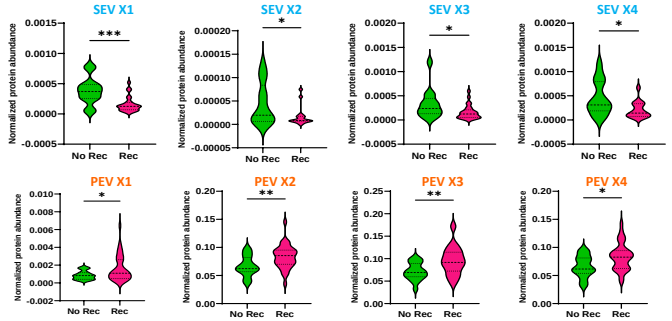
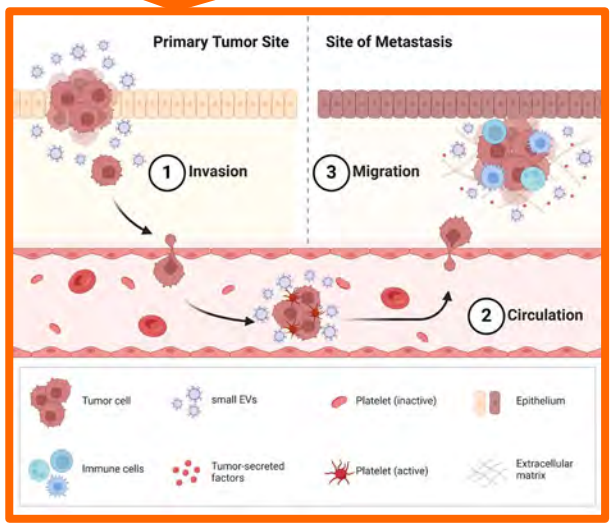
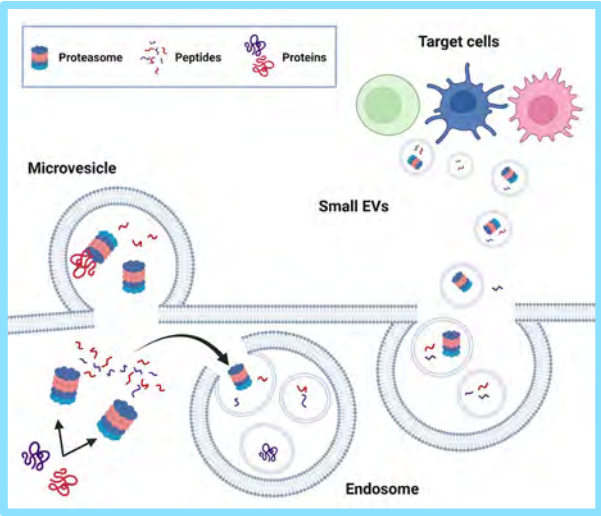


Fig 4. (A) Violin plots of normalized protein abundance of four proteasome subunits in patients with and without recurrence. Patients experiencing recurrence exhibited reduced levels of proteasome subunits within their salivary small EVs. (B) Violin plots of normalized protein abundance of four plasma small EV proteins in patients with and without recurrence. Increased levels of proteins associated with cancer cell migration and invasion were observed in plasma small EVs of patients with recurrence.

Plasma-derived small EVs can be involved in facilitating the **invasion and migration of cancer cells**.





Proteasome-containing salivary small EVs might contribute to **antigen processing and presentation**.

REVOLUTIONISING NUTRITION CARE: ASSESSING THE IMPACT OF A DIGITAL DELEGATED CARE MODEL

Amanda Adams[1], Jennifer Ellick[1, 2], Simone McCoy[1], Adrienne Young[1, 2], Hannah Olufson[1]
Surgical, Treatment and Rehabilitation Service (STARS), University of Queensland, Royal Brisbane and Women's Hospital (RBWH)

Background: Evidence suggests delegating standard & supportive nutrition care tasks to dietetic assistants (DAs) allows dietitians more time to reinvest in specialised nutrition care and high-value tasks[1]. At the Surgical, Treatment and Rehabilitation Hospital (STARS), a digital delegated model of care was implemented to automate referrals for patients at risk of malnutrition and nutritional decline to DAs for assessment and management under the supervision of the dietitian.

Aim: To evaluate the effectiveness of a digital delegated model of care (MOC) in supporting high-value nutrition care and managing malnutrition whilst maintaining patient satisfaction

METHODOLOGY

Time in Motion Study
- Observational and self-reporting methods collected over 1 month
- Quantified time dietitians (n=7) and DAs (n=8) spent on daily tasks
- Task categories included standard, supportive and specialised nutrition care, research, quality Improvement, food service management, task relating to delegation model

Nutrition Audit
- 2023 Audit identified malnourished and at risk patients (n=59/136) seen under the MOC
- Data collected on patient experience, nutrition care and status, nutrition care provider (DA, DT or both)

ieMR & RiskMan
- Occasions of Service across all 6 inpatient wards (rehab, GEMS, maintenance, short stay surgical patients) over 6 months in 2023
- Patient Demographics
- Risk and Incidents related to MOC

Results

DAs spent **50%** (1430min/day) of their time providing standard & supportive nutrition care to patients

Inpatient dietitians spent most of their time delivering specialised nutrition care (**53%**, 2496min/wk) compared to standard and supportive nutrition care (**9%**, 446min/wk).

Over 6 months, DAs completed **54%** (1783) of total Occasions of Service in Dietetics

No clinical incidents reported relating to Digital Delegated MOC or Hospital Acquired Malnutrition

10% (715min/wk) of DA and Dietitian time was spent on delegation/supervision tasks for the MOC

Senior Dietitians reinvested time in high-value tasks including quality activities & research **(8%)**, supervision & training (**16%**) and foodservice management **(8%)**

98% (n=58/59) of patients under the MOC were on an appropriate nutrition care plan

But what do our patients think?

Most patients managed by the DAs (**83%**, n=19/23) reported they were satisfied with their nutrition care and felt it supported their rehabilitation and/or recovery.

Summary: A digital delegated model of care allows dietitians to reinvest their time in specialised nutrition care and high-value tasks without compromising the patients' nutrition experience or care.

References: 1. Bell J, Young A, Hill J et al. (2018) Rationale and developmental methodology for the SIMPLE approach: A Systematised, Interdisciplinary Malnutrition Pathway for impLementation and Evaluation in hospitals. Nutr Diet, 75(2), 226-234.

HERSTON HEALTH PRECINCT SYMPOSIUM 2024
QUT Centre for Immunology and Infection Control
QIMR Berghofer Medical Research Institute THE FUTURE OF HEALTH
CSIRO Australian e-Health Research Centre
The University Of Queensland AUSTRALIA CREATE CHANGE
HERSTON HEALTH PRECINCT
RBWH Foundation Advancing patient care and life-saving research
QUT
Metro North Health
Queensland Government

The Dietitian First Gastroenterology Clinic in the Digital Age

Embracing technology to provide timely care closer to home

Simone McCoy[1], Jennifer Ellick[1], Amanda Adams[1], Kellie Stockton[1], Adrienne Young[2], Mark Appleyard[1], Enoka Gonsalkorala[1]
[1]Surgical, Treatment and Rehabilitation Service (STARS), [2]Royal Brisbane and Women's Hospital (RBWH)

Background

- The Dietitian First Gastroenterology Clinic (DFGC) is a safe and effective allied health led model of care that reduces wait times and provides cost savings, however scale and spread beyond metropolitan areas is slow[1,2].
- There are increased numbers of patients waiting outside clinically recommended time frames for specialist gastroenterology care across Queensland

Aim: To implement a statewide, dietitian led telehealth service to improve access to specialist outpatient care within Queensland.

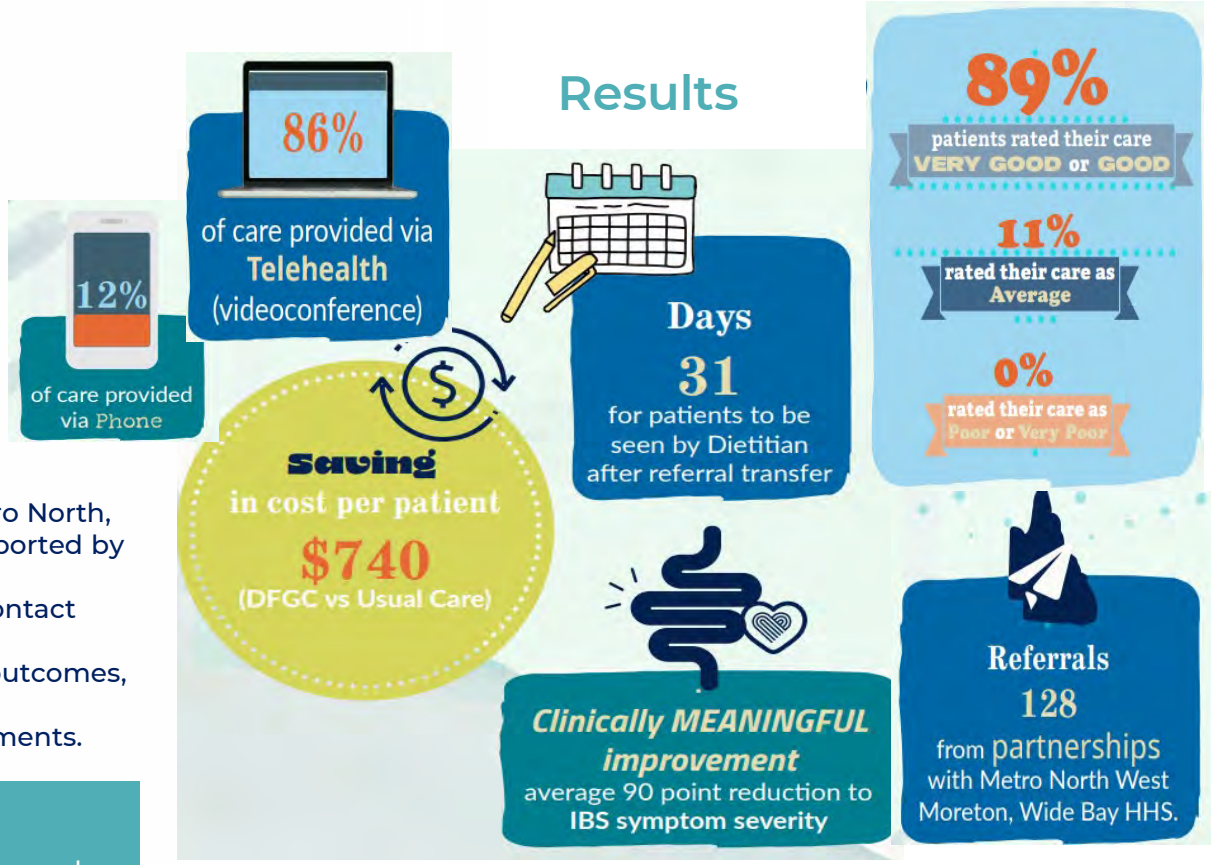
Methods

- The Surgical, Treatment and Rehabilitation Service (STARS), formed partnerships with Metro North, West Moreton and Wide Bay health services and consumers to pilot this virtual DFGC, supported by an Office of the Chief Allied Health Officer (OCAHO) grant.
- Contributing to statewide load sharing, STARS Dietitians work independently as the first contact practitioner for suitable category 2 and 3 patients referred to gastroenterology.
- Digital systems were utilised to manage referrals, documentation, virtual care and health outcomes, intervention and information sharing.
- Co-design workshops with consumers and staff were facilitated to inform service improvements.

Conclusions

Recommendations include investment into digital systems to overcome barriers related to manual referral triaging and to support diversion to alternative care pathways across health services.
Our team continue to advocate for these advancements to provide timely care closer to home and support the adoption of innovative allied health models of care.

Results



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2. Deloitte. Queensland Health – Allied Health Profession's Office of Queensland. Allied health led models of care: case studies. 2021.

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

POPULATION PHARMACOKINETICS OF INTRAVENOUS VITAMIN C IN ADULTS WITH SEPSIS IN THE INTENSIVE CARE UNIT
SUBSTUDY OF THE LESSENING ORGAN DYSFUNCTION WITH VITAMIN C (LOVIT TRIAL)

María Patricia Hernández Mitre [1], Neill KJ Adhikari [2,3], François Lamontagne [4,5], Salmaan Kanji [6], Marie-Claude Battista [5], Julie Ménard [4], Sheila Sprague [7], Marie-Hélène Masse [4], Jason A. Roberts [1,8,9]

[1] UQ Centre for Clinical Research, The University of Queensland, Australia; [2] Sunnybrook Health Sciences Centre, Canada; [3] University of Toronto, Canada; [4] Research Centre of the Centre Hospitalier Universitaire de Sherbrooke, Canada; [5] Université de Sherbrooke, Canada; [6] The Ottawa Hospital Research Institute, Canada; [7] McMaster University, Canada; [8] Herston Infectious Diseases Institute (HeIDI), Australia; [9] Royal Brisbane & Women's Hospital, Australia

OVERVIEW. This was a population pharmacokinetics (popPK) substudy of a multicentre RCT testing the effect of vitamin C on 28-day mortality and persistent organ dysfunction (primary outcome) in critically ill patients with sepsis.

METHODS. Critically ill patients with sepsis were included. Vitamin C was administered intravenously at 50 mg/kg every 6 h for 96 h. Blood samples were collected on Days 1, 3, and 7 from most patients (74%), with intensive sampling for five patients. Vitamin C (ascorbic acid) plasma concentrations were measured by LC/MS-MS.

- Population pharmacokinetic analysis was performed using Monolix, testing relevant patient and treatment-related factors as covariates. Internal validation was performed using a bootstrap method (n=1000).
- Univariable and multivariable analyses explored associations between 28-day mortality (a secondary outcome in the trial) and patient characteristics.

RESULTS. A total of 303 samples from 161 patients were analysed. A one-compartment model best described data, with clearance (CL) significantly influenced by CKD-EPI eGFR and APACHE II score (Table 1)

Final model equations:

$$CL(L/h) = 3.3 * \left(\frac{CKD - EPI}{67}\right)^{0.64} * \left(\frac{APACHE\ II}{24}\right)^{-0.5}$$

$$V\ (L) = 45.06$$

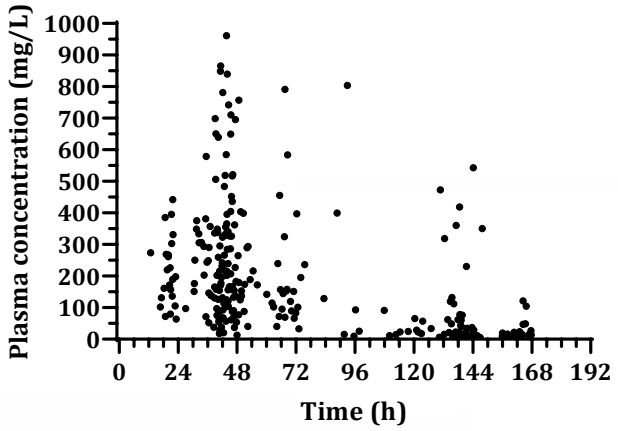

Fig 1. Vitamin C plasma concentration *vs* time

Table 1. Parameter estimates for the final popPK model of vitamin C and bootstrap results

Parameter	Estimate (RSE%) [Shr%]	Bootstrap median (95%CI)
Fixed effects		
CL (L/h)	3.37 (4.66)	3.14 (3.04 – 3.78)
V (L)	45.06 (5.94)	45.64 (39.4 – 64.22)
CKDEPI GFR effect on CL	0.64 (6.24)	0.66 (0.44 – 0.83)
APACHE II score effect on CL	-0.5 (25.4)	-0.48 (-0.78 – -0.16)
Random effects		
Interindividual variability (IIV)		
IIV_CL	0.49 (7.27) [-2.07] (CV% 51.81)	0.49 (0.4 – 0.58)
IIV_V	0.38 (14.1) [-4.24] (CV% 38.98)	0.4 (0.25 – 0.59)
Correlations		
V_CL	0.42 (29.3)	0.49 (0.13 – 0.77)
Residual error		
Additive (mg/L)	8.05 (11.2)	8.11 (0.19 – 9.59)
Proportional	0.2 (13.9)	0.19 (0.1 – 0.29)

RSE, relative standard error; Shr, shrinkage; CI, confidence interval; CL, clearance; V, volume of distribution; CKDEPI, Chronic Kidney Disease Epidemiology Collaboration; GFR, Glomerular Filtration Rate: APACHE II, Acute Physiology And Chronic Health Evaluation II

- ✓ Goodness-of-fit plots indicated acceptable fitting.
- ✓ Bootstrap analysis demonstrated that the final model was stable and robust (Table 1).

Patients who died by trial day 28 had higher Vitamin C exposure (AUCtau) compared to those who survived [median (IQR), 1900.5 (1191.8–2548.2) vs 1017.8 (630–1836.7), p<0.001].

Univariable analysis showed statistically significant associations (p<0.05) between 28-day mortality and age, APACHE II score, renal function, renal replacement therapy, and vitamin C exposure.

Multivariable analysis identified age (OR 1.063 per year, 95% CI 1.024–1.104; p=0.001) and APACHE II score (OR 1.079 per point increase, 95% CI 1.005–1.158; p=0.036) as independently associated with 28-day mortality.

CONCLUSION: THIS STUDY PROVIDES INSIGHTS INTO THE PHARMACOKINETICS OF INTRAVENOUS VITAMIN C IN CRITICALLY ILL PATIENTS WITH SEPSIS.

Evaluating Patient and Pharmacist Perceptions of Personalised Medicines Management Conversations: Insights for Enhanced Pharmacy Practice

AUTHORS

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AFFILIATIONS

Royal Brisbane and Women's Hospital

INTRODUCTION

There has been increasing focus in the last decade on empowering patients to be involved with their care and encouraging consumer engagement in patient-centred healthcare and goals. Despite medicines being one of the most common interventions in healthcare, there is little research on how pharmacists enable and support personalised care for medicines management.

AIM

Explore pharmacist and patients' perspectives of personalised care related to medicines management on surgical and medical wards at the Royal Brisbane and Women's Hospital

METHODOLOGY

June 13th 2024, to July 4th, 2024, an electronic cross-sectional survey was distributed to patients and pharmacists across medical and surgical wards

To participate in the survey, patients must have had

- A completed medication history by a pharmacist
- Provide consent
- Had a clinical pharmacist review within 7 days.

Pharmacists working on inpatient medical or surgical wards were eligible to participate.

RESULTS

Number of surveys completed :

15 Pharmacists **11** Patients

4 out of 5 pharmacists reporting they always explain their role when speaking with patients

2.5 out of 5 patients reported they were explained the role of a pharmacist upon their intial interactions

45% Patients **Vs.** 20% Pharmacists

Stated they had been involved in conversations about what matters most to them about medications

CONCLUSION

These outcomes highlight areas of disparity and alignment between pharmacist and patient perceptions of medication management conversations. This survey is the first step in enabling improved patient/pharmacist conversations supporting personalized care in medicines management.

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

Targeting Human Metapneumoviruses using RNAi technology

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Introduction

- Human Metapneumovirus (hMPV) is a major cause of respiratory tract infections
- It is an etiological agent for pneumonia and bronchiolitis
- Currently, there is **no approved vaccine** or **antiviral** against hMPV
- The advent of RNA interference (RNAi) technology through the use of short-interfering RNAs (siRNAs) represent a paradigm shift in the fight against viral infections
- siRNAs, with their ability to directly target and silence specific posttranscriptional genes, offer a novel mechanism distinct from that of traditional pharmacotherapeutics

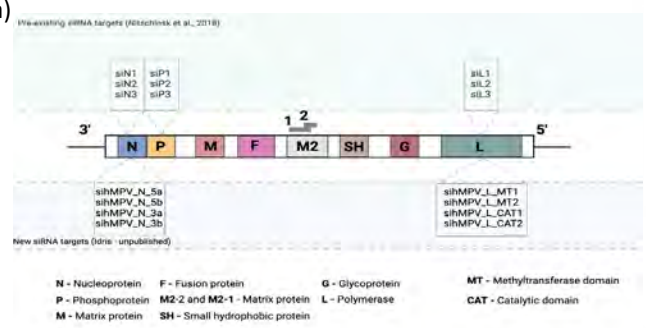
siRNA-based targeting strategy for hMPV

Previously our lab has successfully targeted SARS-CoV-2 [1,2], Respiratory syncytial virus (RSV) [3] and hMPV [4] using RNAi strategies. Therefore, we hypothesize that siRNA delivered to the nasal and lung region, targeting, and thereby silencing key hMPV genes required for replication will reduce viral load. Our current strategy includes:

1. Design and selection of siRNA candidates
- siRNA design purposefully targets conserved regions on the hMPV genome that are functional to its replication strategy
- Bioinformatics to construct an updated hMPV phylogeny (data not shown)
- Ongoing pipeline development to screen and identify the most conserved regions for siRNA targeting (Figure 1)

2. *In vitro* screening
- Viral assays to determine its effectiveness on two lab-adapted strains of hMPV (Can 97-83 and Aus-001)
- TCID50, Focus-forming assays, Immunoplaque, qRT-PCR and dPCR (future work) to determine siRNA antiviral effects
- All siRNA are non-immunostimulatory (data not shown)

a)



b)

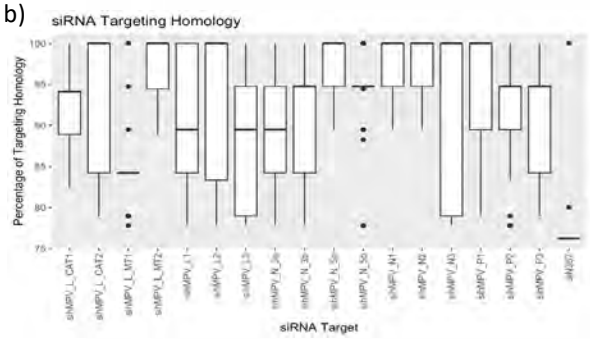


Figure 1. hMPV genome organisation and siRNA targeting homology. (a) Organisation of the hMPV genome from 3' to 5' showcasing the different regions we aim to target using siRNA. (b) These siRNA are screened against all full-length hMPV genomes for the median targeting homology across different strains.

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2. Idris, A., et al., *An intranasally delivered ultra-conserved siRNA prophylactically represses SARS-CoV-2 infection in the lung and nasal cavity*. Antiviral Research, 2024. **222**: p. 105815.
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siRNA targeting reduces viral load

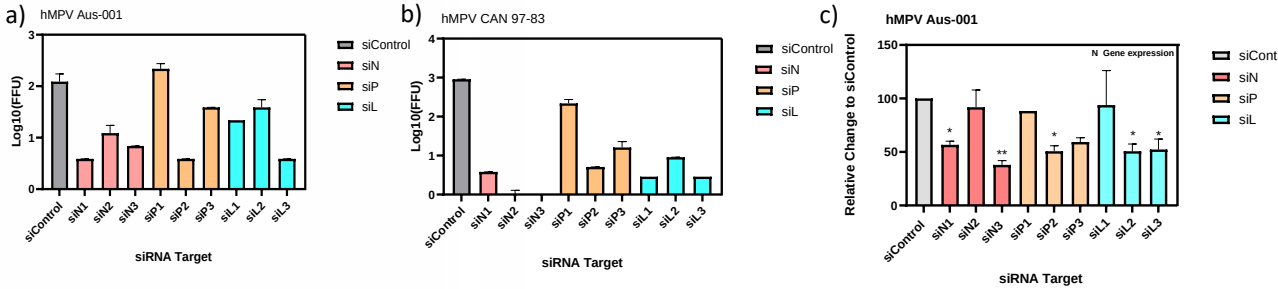

Figure 2. siRNA targeting of key hMPV genes reduced viral titre in both CAN 97-83 and Aus-001 strains. LLC-MK2 cells were transfected with 30nM of siRNA against the nucleoprotein (siN), phosphoprotein (siP) or polymerase (siL) using a Lipofectamine 3000 reagent. Cells were then infected with either the hMPV Aus-001 (a) or Can 97-83 (b) strain at an MOI of 0.01 and a focus-forming unit value was obtained at 6DPI. Error bars denote the mean value of log-transformed focus-forming units of experimental quadruplicates. (c) Effect of N gene mRNA expression following siRNA knockdown in hMPV Aus-001 infected cells. RNA was collected from all experimental groups and expression relative to the control siRNA was quantified using qRT-PCR. *p<0.05, **p<0.001, one-way ANOVA.

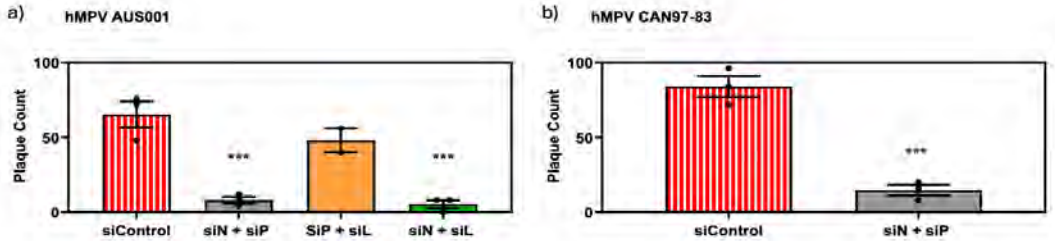

Figure 3. Preliminary results on multiplexing siRNA to target different viral genes of hMPV. LLC-MK2 cells were transfected with 30nM of each top targeting siRNA candidate as a single formulation cocktail using a lipofectamine 3000 reagent. Cells were the infected with hMPV and a cellular overlay was added to fix the cells. At 6DPI cells were fixed and stained, then counted for infectious focus-forming units (plaques). ***p<0.001, one-way ANOVA. Error bars denote mean standard error of the mean from of three experimental replicates.

Future directions

- Newly designed siRNA targets (as shown in Fig. 1a) will be screened *in vitro*
- Top siRNA candidates will be multiplexed, targeting different genes with a single formulation
- Effective pharmacological use of siRNA requires a suitable 'carrier' that can delivery nucleic acid cargo to the intended site of action
- We believe that Lipid-nanoparticles (LNPs) are currently the most clinically advanced non-viral gene delivery method
- Therefore, siRNA will be packaged into several LNP formulations that have shown to have high affinity for the nasal and lung regions [5]
- These siRNA-LNP formulations will be tested in primary bronchial and nasal epithelial cells (Air-liquid interface culture)
- The best formulations will be tested *in vivo* in hMPV infected animal models

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

Development of a Validated Finite Element Dataset for Investigating Shoulder Instability

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[2]Herston Biofabrication Institute, Metro North Hospital and Health Service, Brisbane, QLD, Australia
[3]Department of Orthopaedic Surgery, Royal Brisbane & Women's Hospital, Brisbane, Metro North Hospital and Health Service, Brisbane, QLD, Australia

INTRODUCTION

- **Background:**

Latarjet surgery plays an important role in treatment of the recurrent shoulder dislocations or instability**(Figure 1)**.

- **Aim:**

Developing a validated FEM dataset is essential for optimizing graft stability.

Methodology

- **Input data:**

The dataset consists of CT scans from 11 donors with no evident shoulder abnormalities (Age: 69.3 ± 8.6 years)[1] **(Figure 2)**.

- **3D modeling:**

Using 3-Matic software, both Latarjet fixations SS and SB fixation were performed on the models **(Figure 3)**.

- **FEM:**

3D model was imported in ABAQUS CAE 2022 for FE analyses.

- **Simplification:**

A screw was treated as a hollow cylinder, and a beam connector was used as the Suture-Button.

- **Meshing Process:**

The tet-4 element was created on the model. A mesh study was conducted on the graft displacement, and the size of 1.4 mm was chosen as the outcome **(Figure 4)**.

- **Mapping Material property:**

The grey levels in the images were calibrated to equivalent bone density values, assuming cortical density equal to 1g/cm³ and Marron 1g/cm³ **(Figure 5)**[2].

- **Contact:**

The screw was attached to the graft with frictional contact with the glenoid (μ=0.4 [2]). The displacement of the graft was measured by applying a cyclic load of 200 N. The CT data was segmented to create 3D models of the scapulae **(Figure 6)**.

- **Loading:**

A displacement was applied to the graft to achieve a reaction force of 200 N **(Figure 7)**.

Figure 1. Latarjet Procedure

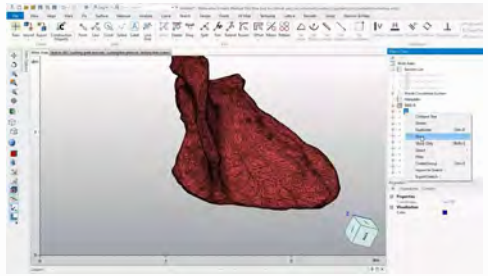

Figure 3. 3D modelling

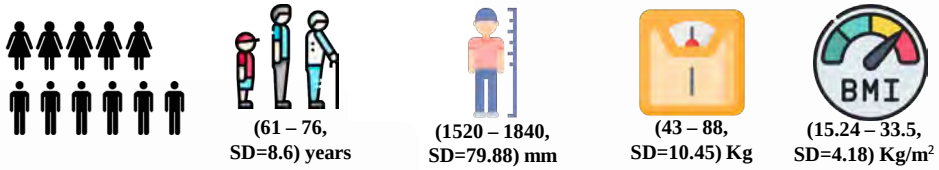

Figure 2. Input data

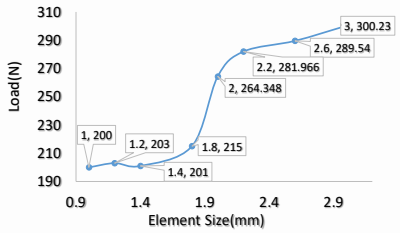

Figure 4. Mesh study

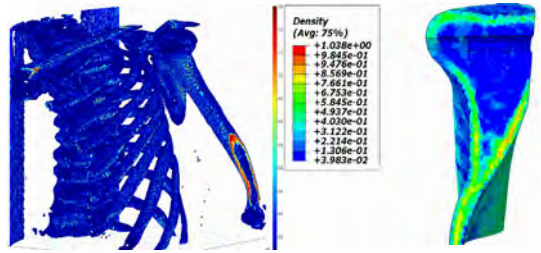

Figure 5. Distribution of density

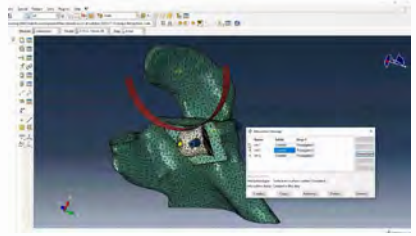

Figure 6. contacts

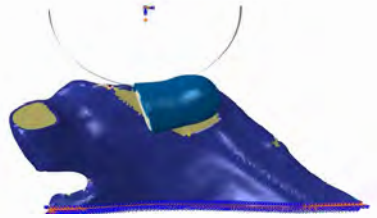

Figure 7. loading

	Exp(mm)	FEM(mm)	p-value	SS/SB(Exp)	SS/SB(FEM)
Screw-Screw	0.13±0.04	0.21±0.05	0.15	0.48	0.45
Screw-Button	0.27±0.21	0.46±0.12	0.0032		

Figure 8. The mean value of the results

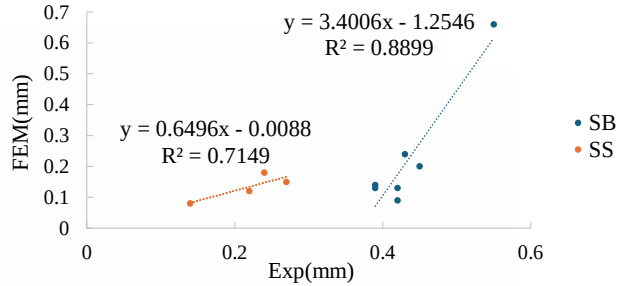

Figure 9. R-squared for SS and SB fixation

RESULTS AND DISCUSSION

The graft displacement for the SS is (0.21± 0.043) (p=0.15) mm while this data for the SB is (0.46± 0.055) (p=0.001) (Figure 8). The coefficient of determination yielded R2 values of 0.71 for SS and 0.88 for SB, indicating a good fit for the experimental results **(Figure 9).**

Conclusion

This FEM dataset is a suitable alternative for considering the effects of bone morphology and quality. These models have the potential to reduce costs and save time in future research.

ACKNOWLEDGEMENTS

Australian Research Council (IC190100020; FT180100338) .

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