System Change Intervention for Implementing Smoking Cessation At Scale in Psychiatry

Sally Plever[1,2,3], Steve Kisely[4,5], Billie Bonevski[3,6], Irene McCarthy[1], Emma Ballard[7], Melissa Anzolin[1], Brett Emmerson[1], John Allan[8], Dan Siskind[4,5] & Coral Gartner[2,3]

[1]Metro North Mental Health, MN HHS; [2]School of Public Health, UQ; [3]NHMRC Centre of Research Excellence on Achieving the Tobacco Endgame, UQ, [4]School of Clinical Medicine; UQ; [5]Metro South Addiction and Mental Health Service, MS HHS; [6]Flinders Health and Medical Research Institute, Flinders University[7];QIMR Berghofer Medical Research Institute; [8]Mental Health Alcohol and Other Drugs Branch, CEQ.

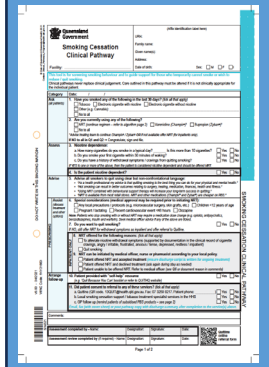
BACKGROUND & AIM

Tobacco-related disease is a leading cause of premature mortality *(up to 15years)* for **people living with mental illness.**

Psychiatry services are well placed to treat, but struggle to implement tobacco treatment.

AIM: Evaluate a **system change intervention for implementing tobacco treatment** in inpatient and outpatient **psychiatry** settings.

SYSTEM CHANGE INTERVENTION



Local improvement strategies: ASK about smoking (status) & **OFFER** Smoking Cessation Clinical Pathway (Pathway).

Implementation: services provided **6-monthly statewide forums (**education, benchmarking, target setting) & **Smoking status reports & Pathway completion reports**.

During implementation **outpatient settings also received a QH Quality Improvement Payment (QIP)** for achieving **increasing Status & Pathway targets** ($1M shared statewide each FY).

ANALYSIS

Study Design: Secondary analysis of statewide health inpatient QHAPDC (Oct 2015-Dec 2020) & outpatient CIMHA (Jul 2017-Jun 2023) **administrative datasets.**
Participants: All **inpatient discharges** and open **outpatient episodes** during the reference periods.
Outcome Measures: Changes in **smoking status documentation & documented pathway completion.**
Analysis: Interrupted time series analysis.

INPATIENT Pathway Completion

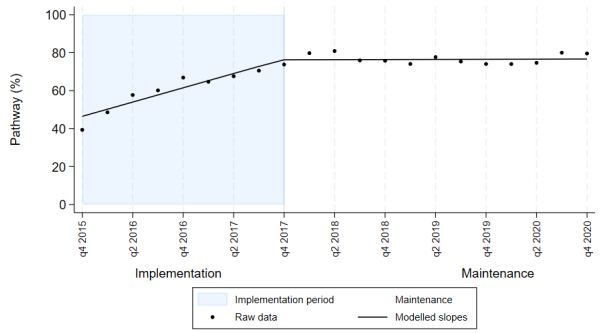


Fig 1. Statewide changes in the % inpatient discharges identified as smoking with pathway recorded during implementation (Oct 2015–Sept 2017) and maintenance (Oct 2017–Dec 2020).

OUTPATIENT Pathway Completion

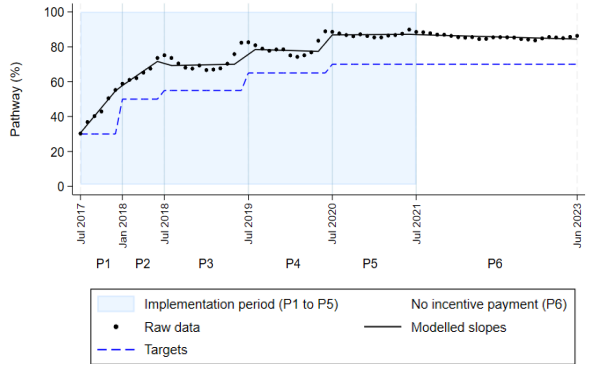


Fig 2. Statewide changes in % outpatient episodes identified as smoking with Pathway recorded during implementation (Jul 2017-Jun 2021) and maintenance (Jul 2021-Jun 2023). *P = QIP payment periods*

STATEWIDE RESULTS

1. **HIGH SMOKING RATES statewide in inpatient 56% and outpatient 53% psychiatry.**
2. **SIGNIFICANT INCREASES IN** SMOKING STATUS & **SUSTAINED HIGH REPORTING RATES (>90%) despite small significant declines post implementation (4% inpatient & 2% outpatient).**
3. **SIGNIFICANT INCREASE IN PATHWAY DOCUMENTATION which was SUSTAINED post-implementation.**

CONCLUSIONS

A system change intervention has potential to sustainably implement smoking cessation in diverse psychiatry settings at scale.

Tobacco treatment in psychiatry is vital to addressing tobacco-related health inequality and impact disproportionately high mortality rates.

Ethics: MNH HREC/2021/QRBW/77580; UQ 2021/HE002750; PHA 77580.1

Evaluating the i-gram tool for antimicrobial stewardship in Northern Australia

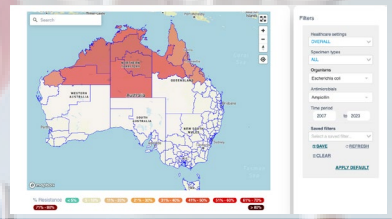
Yukiko Ezure[1], Teresa M, Wozniak[2] (co-first author), Amalie Dyda[1], Caroline Chen[3,4], Lisa Hall[1]

[1]University of Queensland, Brisbane, Australia, [2]Australian e-Health Research Centre, CSIRO, Brisbane, Australia, [3]Royal Melbourne Hospital Guidance Group, Melbourne, Australia, [4] National Centre for Antimicrobial Stewardship, Department of Infectious Diseases, University of Melbourne, Melbourne, Australia

Background

Antimicrobial stewardship optimises antibiotic use and combats antibiotic resistance. Access to local antimicrobial susceptibility data is essential for effective therapy. Traditional cumulative antibiograms are hard to access in many regional and remote Australian settings. This, i-gram, a digital antibiogram, was developed in 2021 on the HOTspots surveillance platform, providing region-specific data for Northern Australia. In 2022, a Delphi survey informed further refinement of i-gram.

A heatmap showing prevalence of AMR on the HOTspots platform

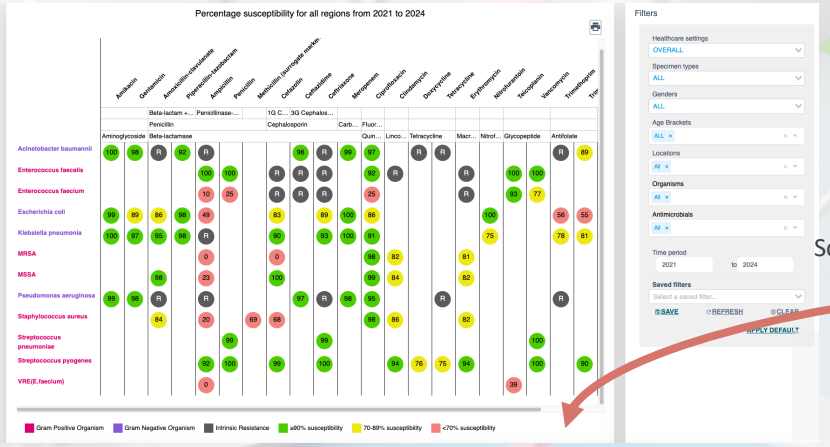


Purpose of the Study

The study aims to evaluate the generalisability and usability of the i-gram tool, a digital antibiogram, beyond Northern Australia. It seeks to gather insights from urban and regional stewardship teams in Queensland to optimise the tool's adoption in routines stewardship practice

Methods

Interactive scenario-based problem-solving workshops



Scan to access the i-gram

Insights from this study will guide further development and refinement

Read the scenarios → Access to the i-gram → Assess usability → Evaluation & Feedback → Discussions

Workshop Scenario overview: Participants will work through a simulated clinical case/ task tailored to antimicrobial stewardship. The scenario will challenge them to use the i-gram tool, considering the optimisation of antibiotic use and patient outcomes.

Thanking-aloud

Data Collection:

Data will be collected through a thinking-aloud method, audio recordings, and semi-structured discussions to capture real-time cognitive progress and in-depth feedback from participants.

Expected impact

This study will identify practical steps enhance the uptake and use of the i-gram tool and will provide insights into tool's scalability in various setting, such as contributions to the development of region-specific antimicrobial stewardship strategies and wider adoption.

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

Don’t Stress! A Review of Perioperative Glucocorticosteroid Stress Dosing at the Royal Brisbane and Women’s Hospital

Kate Murphy[1], Katharine Dekker[1], Dr Priyanka Dhillon[1], Eloise Glover[1]
1.Royal Brisbane & Women’s Hospital

Aim

To review the management of perioperative glucocorticosteroid (GC) stress dosing at the Royal Brisbane & Women’s Hospital.

Methods

A retrospective audit was conducted of GC stress dosing during the perioperative period. Patients taking an oral GC, undergoing elective surgery, and seen by a pharmacist in Pre-Admission Clinic (PAC) from 01/01/22 to 01/01/23 were identified using the Enterprise Liaison Medication System (ELMS). Data collected included patient demographics, surgery details (minor, intermediate, or major), and any recommended or prescribed stress dosing made during the perioperative period. This was compared with best practice guidelines.[1] Data was analysed descriptively and, where data met assumptions, using chi-square tests.

Results

A total of 128 patients undergoing 141 surgeries were included. Surgery type significantly impacted prescribing, with major surgeries the most likely to receive additional GC dosing in the perioperative period (X^2=54.3, p-value <0.001). Additional dosing was most prescribed intraoperatively, as a single dose of IV dexamethasone or hydrocortisone. Only 7% (4/58) of major and 3% (1/35) of intermediate surgical encounters had stress dosing prescribed in line with ‘best practice’ guidelines, with the most common variation being no additional post-operative GC dosing. Patients with a recommendation for stress dosing at PAC were significantly more likely to receive stress dosing perioperatively (X^2=13.7, p= <0.001). Additionally, 18% (26/141) of patient encounters did not receive their usual maintenance dose post-operatively.

Conclusion

This audit demonstrated that there are inconsistencies in the perioperative management of GC at RBWH with significant deviation from current recommended guidelines. These results suggest that early identification and documentation of a plan improves the likelihood of receiving stress dosing. Further investigation is recommended to inform hospital prescribing practices.

Table 1 – Patient demographics

Patient details		
	Total number of encounters	141
	Total number of patients	128
	Age - median (range)	63 (23-89)
	Male - no.(%)	71 (55%)
ASA score		
	2	13
	3	108
	4	20
Pre-op Medication details		
	Cortisone	13
	Hydrocortisone	8
	Prednisolone	120
Pre-op indication		
	Primary	7
	Secondary	14
	Tertiary	120
Surgery grade		
	Minor	48 (34%)
	Intermediate	35 (25%)
	Major	58 (41%)

Figure 1 – Surgery specialty and grade

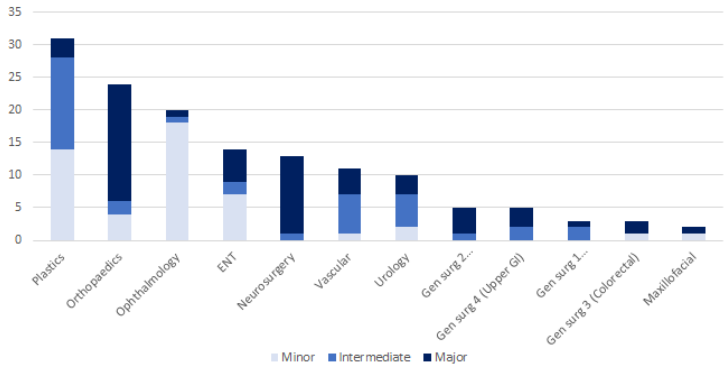


Table 2 – Summary of best practice guidelines[1]

Recommended doses for intra- and postoperative steroid cover in adults with primary & secondary AI		
	Intra-operative steroid replacement	Postoperative steroid replacement
Surgery under anaesthesia (general or regional)	Hydrocortisone 100mg IV on induction, followed by immediate initiation of a continuous infusion of hydrocortisone 200mg 24 h^{-1}	Hydrocortisone 200mg 24 h^{-1} by IV infusion while nil by mouth or for patients with postoperative vomiting Resume enteral – double hydrocortisone doses for 48 h or for up to a week following major surgery With rapid recovery, resume enteral – double hydrocortisone doses for 24 h
Recommended doses for intra- and postoperative steroid cover in adults receiving adrenosuppressive doses of steroids (prednisolone equivalent ≥ 5 mg for 4 weeks or longer)		
	Intra-operative steroid replacement	Post-operative steroid replacement
Major surgery	Hydrocortisone 100mg IV at induction, followed by immediate initiation of a continuous infusion of hydrocortisone 200mg 24 h^{-1}. Alternatively, dexamethasone 6-8 mg IV, if used, will suffice for 24 h.	Hydrocortisone 200mg 24 h^{-1} by IV infusion while nil by mouth or for patients with postoperative vomiting Resume enteral glucocorticoid at double the pre-surgical therapeutic dose for 48 h if recovery is uncomplicated. Otherwise continue double oral dose for up to a week
Body surface and intermediate surgery		Double regular glucocorticoid dose for 48 h, then continue usual treatment dose if uncomplicated

Table 3 - Incidence of stress dosing during perioperative period

Surgery grade	Stress dosing received during perioperative period N (%)	Stress dosing given according to best practice guidelines N (%)	Total
Minor	9 (19%)	27 (56%)	48
Intermediate	21 (60%)	1 (3%)	35
Major	53 (91%)	4 (7%)	58

References
1. Woodcock T, Barker P, Daniel S, Fletcher S, Wass JA, Tomlinson JW et al. Guidelines of the management of glucocorticoid during the peri-operative period for patients with adrenal insufficiency. Guidelines for the Assoc. of Anaesthetists, Royal College of Physicians and Society of Endocrinology UK. Anaesthesia. 2020;10.1111/anae.14963

INTER- AND INTRA- OPERATOR VARIABILITY IN QUANTITATIVE ULTRASOUND ASSESSMENT OF NAFLD

Keys. E[1], Edwards. C[1], Allen. H[1], McMahon. K[1,2], Aikebuse. M[3], Bhasker. V[3], Powell. E[3]

INTRODUCTION

- Qualitative or B-mode ultrasound is highly operator dependent leading to significant inter- and intra-observer variability.
- Quantitative ultrasound aims to reduce inconsistencies (Seneviratne et al., 2023).
- This poster examines the intra- and inter-rater variability of quantitative ultrasound techniques in assessing Non-alcoholic Fatty Liver Disease (NAFLD).
- The research is part of a broader investigation comparing quantitative ultrasound with MRI for the assessment NAFLD, focusing on identifying technical and biological limitations affecting accuracy. The study is ongoing, with a target of 40 participants.

OBJECTIVE

- Assess the inter- and intra- operator variability of 2 types of quantitative ultrasound measurements using 2 machines for the evaluation of NAFLD. It is expected that there will be high levels of repeatability and reproducibility due to strict adherence to protocols.

METHODS AND MATERIALS

- 19 participants with NAFLD. Each participant's liver imaged with:
  - FibroScan (Echosens; Paris, France)
  - 3T PRISMA MRI scanner (Siemens Healthineers; Erlangen, Germany)
  - Siemens ACUSON Sequoia ultrasound machine (Siemens Healthineers; Erlangen, Germany)
  - Philips Epiq Elite v9+ ultrasound machine (Philips Healthcare; Best, Netherlands)
- 5 measurements per participant per ultrasound system
- 10 participants scanned by 2 users
- Siemens Ultrasound Derived Fat Fraction (UDFF) gives a percentage of liver fat.
- Philips Liver Fat Quantification (LFQ) gives a value in dB/cm/MHz. Liver values sit within 0.5- 1.1dB/cm/MHz (Ferraioli et al, 2022).

RESULTS

Table 1: Intra- operator variation (repeatability)

Parameter	*Number of participants*	*Number of measurements*	*Coefficient of variation (CV) (95% CI)*	*Interclass correlation (ICC) (95% CI)*	*Repeatability coefficient (RC) (95% CI)*
Siemens	19	95	13.2 (9.9-16.6)	0.93 (0.87-0.97)	5.8 (3.9-7.7)
Philips	19	95	5.2 (3.8-6.7)	0.79 (0.65-0.9)	0.096 (0.065-0.13)

Table 2: Inter- operator variation (reproducibility)

Parameter	*Number of participants*	*Number of measurements*	*Coefficient of variation (CV)*	*Interclass correlation (ICC) (95% CI)*	*Repeatability coefficient (RC)*
Siemens	10	50	12	0.85 (0.49- 0.96)	8.6
Philips	10	50	3.4	0.83 (0.45- 0.96)	.07

Bland-Altmann Plots

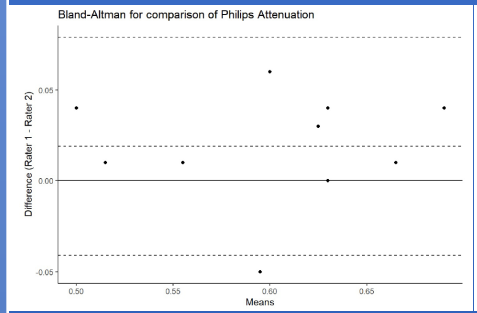


Figure 1: Phillips

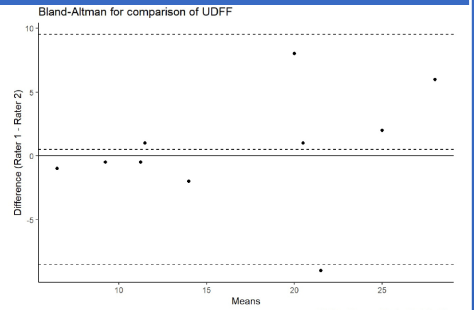


Figure 2: Siemens

DISCUSSION

- Intra- operator variability
  - ICC high levels of agreement with both machines
  - CV good for Philips and acceptable for Siemens
- Inter- operator variability
  - ICC for both machines- high levels of agreement
  - Philips: good agreement (Fig 1)
  - Siemens: reasonable agreement. Higher variability at higher levels of steatosis (Fig 2)
  - CV excellent for Philips and acceptable for Siemens
  - RC increased for Siemens

CONCLUSIONS

High levels of inter- operator and intra- operator agreement are demonstrated with both ultrasound machines, indicating good overall repeatability and reproducibility. Although the RC is expressed in different units for the two machines, the Philips system demonstrated less variability compared to the Siemens system. The variability demonstrated with the Siemens machine may be reduced by acquiring more measurements per participant. Additionally, for follow-up studies on the same participants, a change greater than 5.8% in the UDFF or 0.1dB/cm/MHz with the Philips machine may be necessary for a reliable indication of liver fat change. The CI for the ICC are broad for both machines, a limitation that could be addressed by increasing the number of participants in future studies.

Overall, quantitative ultrasound demonstrates encouraging repeatability and reproducibility.

REFERENCES

Ferraioli, G., Kumar, V., Ozturk, A., Nam, K., Korte, C. L. d., & Barr, R. G. (2022). US Attenuation for Liver Fat Quantification: An AIUM-RSNA QIBA Pulse-Echo Quantitative Ultrasound Initiative. *Radiology*, *302*(3), 495-506. https://doi.org/10.1148/radiol.210736

Seneviratne, N., Fang, C., & Sidhu, P. S. (2023). Ultrasound-based hepatic fat quantification: current status and future directions. *Clinical radiology*, *78*(3), 187-200. https://doi.org/10.1016/j.crad.2022.10.003

CONTACT

Elspeth Keys
bellekeys@gmail.com

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

Development of an instrument to assess constructs that impact Clinical Educator (CE) engagement in physiotherapists

Joanna Hargreaves [a], Shaun O'Leary [a,b], Deanne Gannaway [c]

Background: Recruitment and retention of dedicated CEs is challenging. In the broader work-integrated learning healthcare literature, three constructs have been shown to impact CE performance and perseverance: educator identity, motivation, and self-efficacy. Assessment of these constructs in physiotherapists requires a valid instrument.

Aim

This study aimed to construct an instrument to assess CE identity, motivation and self-efficacy in physiotherapists.

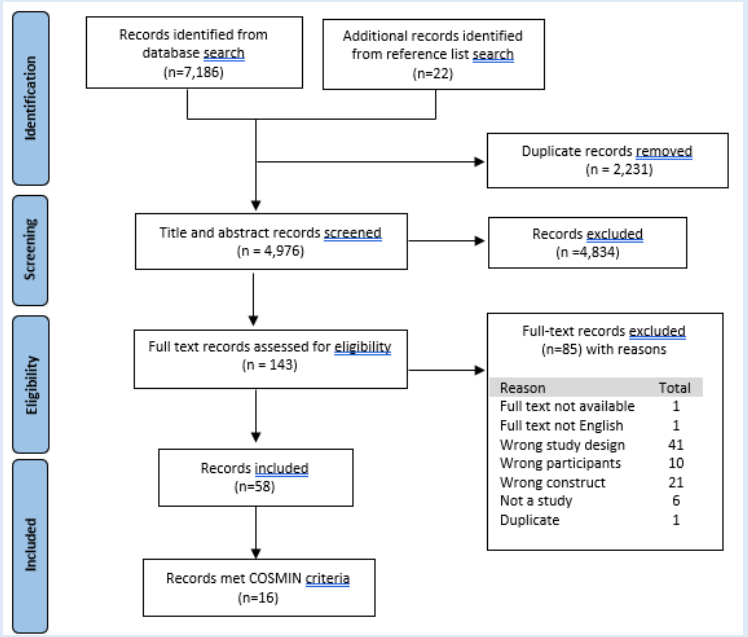
Method

(i) A scoping review was used to identify instruments that measure these 3 constructs in CEs. An item pool was generated from instruments that met COSMIN Risk of Bias criteria for measurement quality.

(ii) A modified eDelphi was used to construct a purpose-built instrument. Participants completed 3 rounds of questionnaires online. Consensus was defined *a priori* as 70% agreement.

Results

Fig 1. PRISMA flow diagram of scoping review process



(i) No instrument(s) were identified that could directly be applied to physiotherapy. It was also recommended that Operational Factors be assessed as a fourth construct.

(ii) 31 expert CEs contributed to the Delphi panel, with a response rate by round of 100% (1), 97% (2) and 87% (3). Of the 49 items proposed, all items were modified, 11 items were excluded, and 3 items were added. Two items were revised in rounds two and three, with no further additions or exclusions. The final instrument comprised 40 construct items and 13 demographic questions.

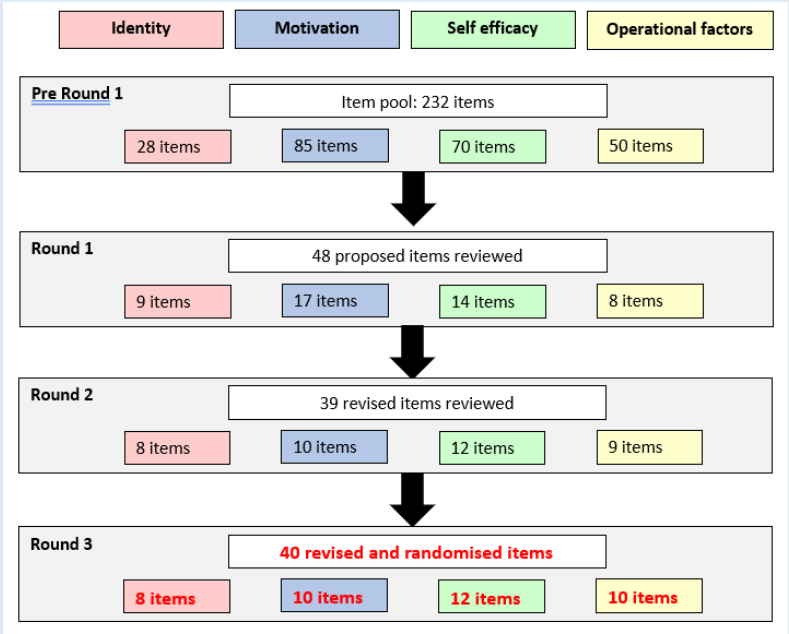


Fig 2. Flow diagram of Delphi rounds

Conclusion

This study constructed an instrument that will enable evaluation of the impact of CE identity, motivation, self-efficacy and operational factors on CE participation by physiotherapists in Australia. Content validity of the instrument was established through a modified e-Delphi process. Future study is required to establish construct validity and to assess inter- and intra-rater reliability of the instrument.

Acknowledgements
This project was funded through a DOPSQ CETI grant 2022/23.

[a] Physiotherapy Department, RBWH
[b] SHRS, UQ
[c] ITaLI, UQ

Enhancing Abnormality Detection from Radiology Reports using Large Language Models (LLMs) to Prevent Missed Fractures in Emergency Department

Jinghui Liu[1], Bevan Koopman[1], Nathan Brown[2], Kevin Chu[2], Anthony Nguyen[1]
[1]Australian e-Health Research Centre, CSIRO [2]Emergency and Trauma Centre, Royal Brisbane and Women's Hospital

Introduction

- Specialists manually ***reconcile radiology reports*** with ED discharge diagnoses to ensure no subtle fractures are missed
- ***AI models can streamline*** this laborious process, detecting abnormalities to ensure patients receive appropriate follow-up care

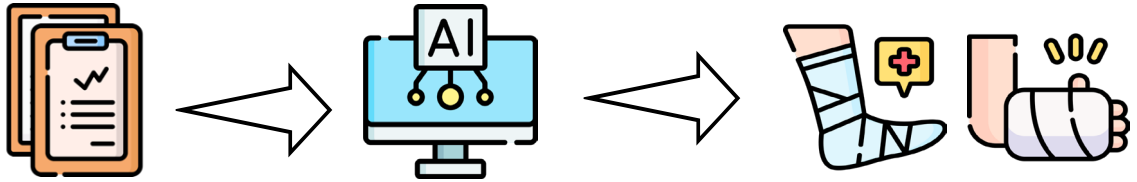
Methods

- Training AI models require extensive annotations, which are often difficult to obtain
- We investigate ***whether LLMs can synthesise radiology reports*** for the task
- We validate the AI models using real-world data from ***three QLD hospitals***

Radiology Reports from ED Written by Clinicians

Synthetic Reports Created by LLMs with No or Little Guidance

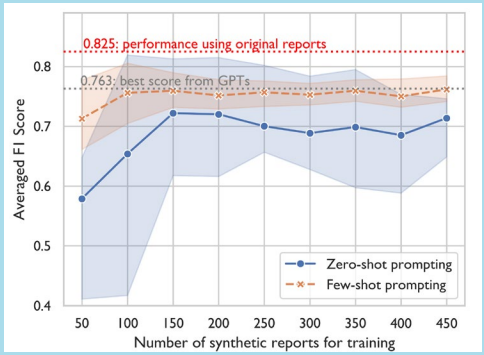
Train AI Model to Identify Patients with Misdiagnosed Fractures



Improve Follow-up Patient Care

Results

- Synthetic reports from LLMs offer ***strong predictive value***
- Locally hosted ***open-source LLMs*** perform as well as proprietary LLMs like ChatGPT
- Local LLMs offer ***greater customisation***, enhancing results
- Combining synthetic and real-world data yields highly ***performant AI models***



Conclusion

- LLMs can generate synthetic report that closely resemble real-world ones, ***helping prevent missed fractures and enhance patient care***
- With the right configurations, ***local LLMs*** offer strong performance and enhanced data security

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

Utilising healthcare incident data to improve patient safety; case study using NGT data

Kate Glen[1,2], Elizabeth Weekes[3], Merrilyn Banks[1], Agi McFarland[4], Grace Xu[1], Jayesh Dhanani[1], Mary Hannan-Jones[1,2]

Affiliation: [1]Royal Brisbane and Women's Hospital, Queensland, Australia, [2]Queensland University of Technology, Australia, [3] Kings College London, England, United Kingdom, [4] The University of Stirling, Scotland, United Kingdom

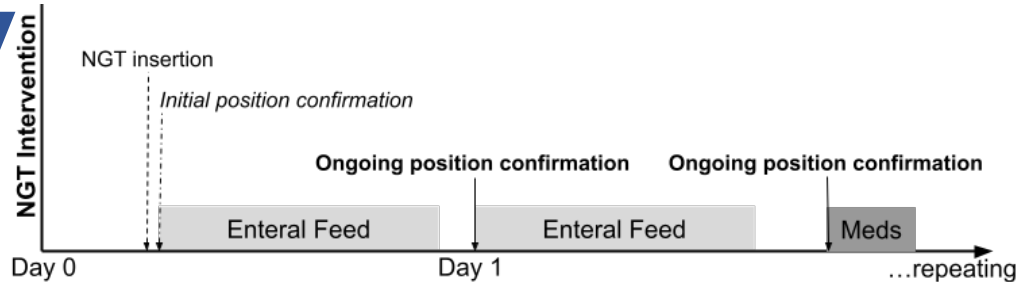
INTRODUCTION

- Clinicians in Queensland and England are encouraged to report healthcare incidents
- Very little analysis is conducted utlising healthcare incident data
- Use of a displaced nasogastric tube (NGT) potentially causes harm and is considered avoidable.

AIM

Describe and understand the clinical context of reported ongoing NGT position testing incidents in Queensland and England risk management systems.

Definition of ongoing NGT position testing



METHODS

Four years of Queensland Health (n=27) and one year of NHS England (n=412) clinical incident data with keywords "nasogastric tube" were obtained from incident data custodians. Manual screening identified incidents relating to ongoing NGT position. Conventional (inductive) qualitative content analysis was conducted by assigning codes to each incident.

RESULTS

5 Queensland Incidents
24 English Incidents – 3 resulted in patient harm

Theme 1: Outcomes: Impacts of ongoing NGT position testing
Theme 2: Incidents related to staff behaviour and knowledge
Theme 3: Incidents related to non-adherence to local procedures
Theme 4: Poor quality of incident reporting

Incident Quotes

Chest x-ray which showed NGT was in oesophagus rather than below the diaphragm still. Pt had been getting fed all afternoon with NGT in the wrong place. (Queensland Health)

Aspirate pH recorded as 6.5 before feed commenced on [DATE] and [DATE+1] despite trust policy stating that pH should be 5.5 or less before feed commenced. (England)

radiology for imaging to confirm placement...Ward staff apparently informed by radiographer that NG was coiled and therefore needed to be removed. NG therefore removed... Subsequently reported by Consultant radiologists as appropriately positioned...unnecessary removal of tube. (England)

Nurse was spoken to and questioned as to why she had not documented the pH before setting up the NG feeding, and she said she simply forgot and could not give any other reason for that. (England)

Patient cannot receive any medications as NG in situ and nurse on the night shift not NG trained and called the bed managers on numerous occasions but nil response (England)

*They didn't get any aspirations this morning, so medications and feed not given. Patient reports that he is very hungry. ..(*England)

Implications

- Qualitative content analysis should be more widely utilised by data custodians to review healthcare incidents to improve patient safety
- Interpersonal relationships and staff behaviours were key in some incidents indicating it is not procedures or clinical process alone which influences patient safety
- Clinicians should be given education on how to accurately complete incident reports with enough detail that they can be used to improve patient safety
- Healthcare managers should be trained on completing incident investigations and be required to investigate more incidents to reduce bias in incident reports

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

An Audit of Ward-Based Intravenous Insulin Infusions at the Royal Brisbane and Women's Hospital

Cameron Holscher[1], Peter Donovan[1], Champika Pattullo[1]

[1]Royal Brisbane and Women's Hospital

Introduction

- The prevalence of diabetes mellitus in Australia is increasing and was associated with 11% of all hospitalisations in 2020-21.[1]
- Patients with diabetes tend to have longer admissions where hyperglycaemia is associated with increased morbidity and mortality, and hypoglycaemia is associated with mortality and increased length of admission.[2,3]

- Intravenous insulin is often required in hospitalised patients with diabetes, including to treat DKA and HHS, and in perioperative diabetes management.
- Audits of variable rate intravenous insulin infusions in the United Kingdom have identified issues such as hypoglycaemia, hypokalaemia, hyponatraemia, inappropriate initiation, inadequate monitoring, and delayed cessation.[4-6]
- No equivalent audits have been conducted in Australia and existing audits focus purely on management of DKA/HHS.[2,7]
- This project aimed to audit intravenous insulin infusions at the Royal Brisbane and Women's Hospital over a 12-month period.

Methods

- 40 patients treated with intravenous insulin infusion between 1st June 2022 and 1st June 2023 were included.
- Only one infusion/patient was audited and if a patient was in ICU for any point during infusion they were excluded.

- Outcomes of interest included:
  - Demographics and pre-morbid diabetes therapies
  - Indication for infusion
  - Appropriate management of other diabetes therapies during infusion
  - Appropriateness of blood glucose and electrolyte monitoring, and intravenous fluid therapies
  - Glycaemic control during infusion
  - Hypoglycaemic episodes
  - Duration of infusion and appropriateness of cessation and/or transition to subcutaneous insulin

References

1. Australian Institute of Health and Welfare. Diabetes: Australian facts [Internet]. Canberra: Australian Institute of Health and Welfare; 2023 [updated 2023 Feb 9; cited 2023 Jul 24]. Available from: https://www.aihw.gov.au/reports/diabetes/diabetes
2. Donovan P, Eccles-Smith J, Hinton N, Cutmore C, Porter K, Abel J, et al. The Queensland Inpatient Diabetes Survey (QuIDS) 2019: the bedside audit of practice. Med J Aust. 2021;215(3):119-24.
3. Comino EJ, Harris MF, Islam MDF, Tran DT, Jalaludin B, Jorm L, et al. Impact of diabetes on hospital admission and length of stay among a general population aged 45 year or more: a record linkage study. BMC Health Serv Res. 2015;15(1):12.
4. Coulden A, Chortis V, Smyth T, Salahuddin S, Hanif W, Ghosh S. A quality improvement project reducing adverse events and improving adherence to guidelines surrounding VRIII usage. BMJ Open Qual. 2022;11(2):e001612.
5. Collard B, Sturgeon J, Patel N, Asharia S. The Variable Rate Intravenous Insulin Infusion Protocol. BMJ Qual Improv Rep. 2013;2(2):u203060.w1409.
6. Rachabattula H, Simmons E, Ghatahora S, Grant P. The Variable Rate Intravenous Insulin Infusion in Clinical Practice 2015: an audit against the new JBDS guidance. Br J Diabetes. 2016;16(1).
7. Khor A, Mohiuddin M. DKA/HHS insulin infusion protocol adherence and patient outcomes in Shelharbour Hospital. Intern Med J. 2023;53:2277-82.

Results

Table 1. Population characteristics*

		N (%) – unless indicated
Sex	Male	26 (65%)
	Female	14 (35%)
Age (years) – mean ± SD		59.7 ± 18.3
Diabetes diagnosis	T1DM	16 (40%)
	T2DM	22 (55%)
	LADA	1 (2.5%)
	Without diabetes	1 (2.5%)
New diagnosis		4 (10%)
T2DM and on insulin		11 (28%)
Insulin regimen	Basal bolus	13 (33%)
	Once daily	3 (7.5%)
	Twice daily	5 (13%)
	Three times daily	2 (5%)
	CSII	2 (5%)
Type of admission	Medical	16 (40%)
	Surgical	24 (60%)
Indication for insulin infusion	DKA	10 (25%)
	HHS	2 (5%)
	Ketosis	8 (20%)
	Fasting	17 (43%)
	Hyperglycaemia	3 (7.5%)

*T1DM – Type 1 diabetes mellitus; T2DM – Type 2 diabetes mellitus; LADA – Latent autoimmune diabetes in adults; CSII – Continuous subcutaneous insulin infusion; DKA – Diabetic ketoacidosis; HHS – Hyperosmolar hyperglycaemic state.

Table 2. Insulin infusion safety and efficacy*

		N (%) – unless indicated
Regular OHAs withheld		16 (94%)
Short-acting insulin withheld		25 (93%)
Long-acting insulin given		15 (78.9%)
BGL monitoring frequency	Hourly	23 (58%)
	At least two-hourly	11 (28%)
	Greater than two-hourly	6 (15%)
BGLs within target range		608 (55.1%)
Electrolytes and renal function monitoring frequency	Once daily	11 (28%)
	Once daily or more	21 (53%)
	Less than once daily	8 (20%)
Appropriate fluid use		26 (65%)
Severe hypoglycaemia		1 (2.5%)
Hypokalaemia		13 (33%)
Hyponatraemia		7 (18%)
Infusion duration (days) – mean ± SD		1.25 ± 0.71
Appropriate duration		36 (90%)
Appropriate cessation		30 (75%)

*OHA – Oral hypoglycaemic agent; BGL – Blood glucose level.

Discussion

- Blood glucose monitoring appeared appropriate, however glycaemic control was suboptimal (55% of BGLs within target range). Given rates of hypoglycaemia were low, this suggests intravenous insulin was not effective, and/or the rate was not adjusted appropriately in response to hyperglycaemia.

- 80% of patients received at least daily monitoring of electrolytes and renal function, however rates of hypokalaemia were high. Future interventions could investigate proactive correction of potassium (such as when potassium is <4 mmol/L) and suggestions for monitoring and correction could be included in a general guideline.

- Fluid prescription was only appropriate in 65% of patients as they were often prescribed both glucose containing and non-glucose containing fluid, regardless of indication and as is standard practice in DKA management.

- Cessation and/or transition to subcutaneous insulin was appropriate in only 75% of patients. This was because either long-acting subcutaneous insulin was not given prior to cessation, or infusion was stopped too abruptly after administration of regular long-acting insulin (<2 hours).

- This audit is subject to the limitations inherent in any retrospective study, including selection bias and recall bias. Subjective assessments were required to determine appropriateness of duration and cessation of infusion.

- Further studies could investigate the factors that lead to these outcomes and evaluate the effectiveness of interventions. A general guideline for use of intravenous insulin infusion should be devised, as the current guideline only applies to DKA.

Diagnosing fetal cleft lip and/or palate: what does fetal MRI add?

Han (Jenny) Xiao, Krishna Pranathi Settipalli, Annah Lane
Department of Medical Imaging, Royal Brisbane and Women's Hospital, Australia

References:
[1] van der Hoek-Snieders, H. E., van den Heuvel, A. J., van Os-Medendorp, H., & Kamalski, D. M. (2020). Diagnostic accuracy of fetal MRI to detect cleft palate: A meta-analysis. *European Journal of Pediatrics*, *179*(1), 29–38.
[2] Ji, C., Yang, Z., Yin, L., Deng, X., Pan, Q., Lu, B., Zhang, J., Jiang, W., & Jiang, X. (2021). The application of three-dimensional ultrasound with reformatting technique in the diagnosis of fetal cleft lip/palate. *Journal of Clinical Ultrasound*, *49*(4), 307–314
[3] de Milly, M., Alison, M., Arthurs, O., Vuillard, E., Oury, J., Elmaleh-Berges, M., Sebag, G., & Belarbi, N. (2013). Is fetal cerebral MRI worthwhile in antenatally diagnosed isolated cleft lip with or without palate? *Prenatal Diagnosis*, *33*(3), 273–278.

Introduction

Cleft lip and/or palate is the most common neonatal craniofacial defect, typically categorised into cleft lip (CL), cleft lip and palate (CLP), or isolated cleft palate (CP). It can be associated with other congenital abnormalities, especially in cases of isolated CP. Current practice:

Often found incidentally on 2nd trimester morphology obstetric US → Tertiary 3D US (under Maternal Fetal Medicine) to further define → Fetal MRI considered to further define palatal involvement, if necessary, or screen for associated abnormalities

Physical factors of MRI versus US

MRI
- Time intensive
- High susceptibility to artefact such as fetal movement (sometimes requiring sedation)

US
- Operator dependent
- Limited use in patients with high BMI, or those with overlying placenta or polyhydramnios

Aim

We performed a literature review followed by an internal audit to determine the diagnostic benefit of fetal MRI in diagnosing fetal cleft lip and/or palate, especially as an adjunct tool post tertiary ultrasound.

Audit Methods

Retrospective review of Karisma® database was performed to identify all fetal MRIs performed between 2019 and July 2024 at our tertiary centre for suspected cleft lip and/or palate, as stated in the indication. Results were compared with preceding obstetric ultrasound results.

Literature review

25 relevant articles published between 2000 and 2024 identified via MeSH and manual search in Embase and PUBMED databases were reviewed. Findings showed:

- Fetal MRI has high diagnostic accuracy for palatal involvement (pooled sensitivity and specificity >93%)[1]
- Ultrasound can provide similar diagnostic accuracy with use of specific palatal views and 3D reconstruction. A statistically significant ($p<0.001$) improvement in palatal involvement detection was seen with 3D ultrasound, when compared to 2D ultrasound alone[2]
- While MRI can detect other associated fetal abnormalities, its role in detecting previously undetected abnormalities (via previous US) is unclear. One study reports 4.6% (out of 87) of fetal MRIs for orofacial clefts detected new cranial pathology[3]

Demographics

58 fetal MRIs

mean ± SD (min – max)

Maternal age:
- 29.0 ± 6.0 years (15.2 – 41.2)

Maternal BMI:
- 26.1 ± 6.9 (15.0 – 46.7)

Time between US and MRI:

13.6 ± 15.7 Days
(0 – 66)

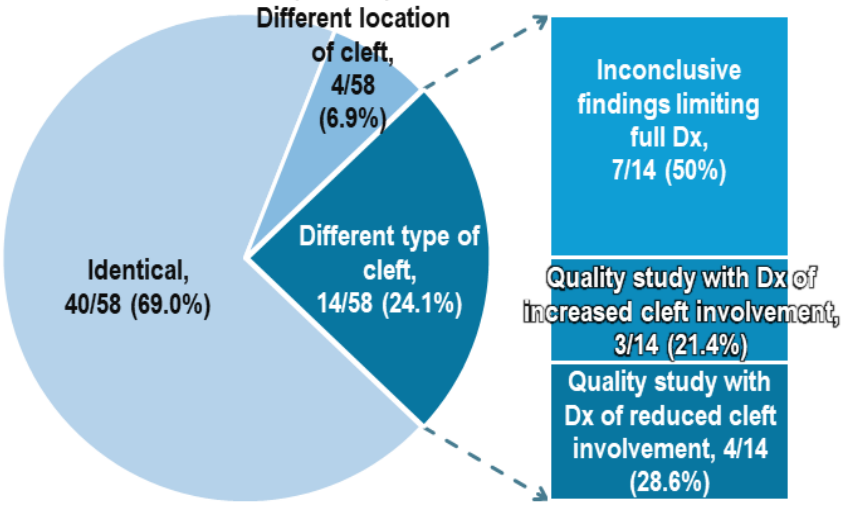
Duration of MRI:

34.1 ± 21.4 minutes
(10 – 128)

Results

- 1 case (1.7%) did not have tertiary 3D US by MFM preceding MRI; all had morphology US prior
- 14/58 (24.1%) MRIs showed associated fetal abnormalities, 8 of which were new findings compared to previous US (8/58, 13.8%)
- 19/58 (32.8%) had inconclusive diagnoses e.g. "probable/not excluded"
- 9/58 (15.5%) were uninterpretable due to motion and/or requiring repeat MRI to confirm diagnoses

Diagnoses by MRI (vs US)



Conclusion

Our results demonstrate that 13.8% of studied MRIs diagnosed new fetal abnormalities formerly undetected on US, higher than previously reported rates. While MRI can define the extent of fetal clefts identified on US, its diagnostic value is significantly limited by a high incidence of artefact.

Minimally Invasive Biomarkers for the Early Detection of Lung Cancer Nodules

Waqar Ahmed Afridi [1], Xi Zhang [1], David Pass [2], Sarju Vasani[3], David Fielding [3] and Chamindie Punyadeera [1]

[1] Griffith University, [2] Queensland Forensic and Scientific Services, [3] Royal Brisbane and Women's Hospital

Introduction

- Lung Cancer is the leading cause of cancer-related mortality worldwide.
- A lung nodule is a small, rounded area of increased opacity, typically less than 30 mm in size, surrounded by lung tissue.
- Minimally invasive biopsies have been suggested as potential biomarkers for triaging lung cancer nodules.

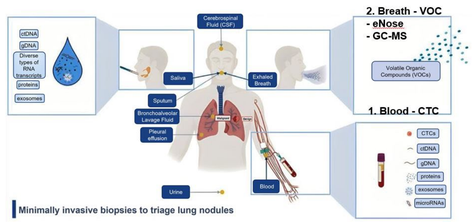


Fig 1. The application of biomarkers using minimally invasive sample collection methods shows promise in differentiating benign from malignant lung nodules.

Aims

- This project aims to establish protocols for VOC breath sampling and a protocol for detecting CTCs in blood samples. This will be followed by a complete clinical workup of the nodule to determine if the pulmonary nodule is benign or malignant.
- We have developed a Nodule diagnostic score by integrating results of breath VOC, eNose scores and blood CTCs, which could be further studied in a larger cohort for effectiveness in distinguishing malignant from benign nodules.

Methodology

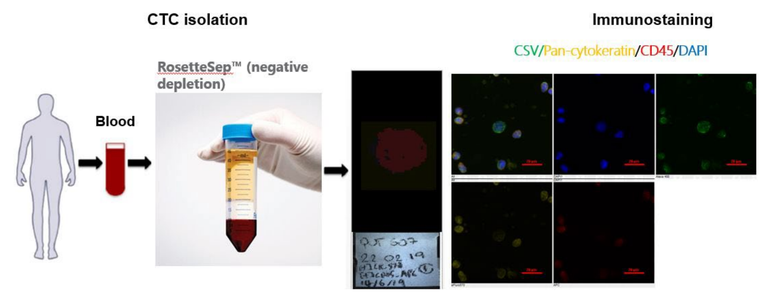
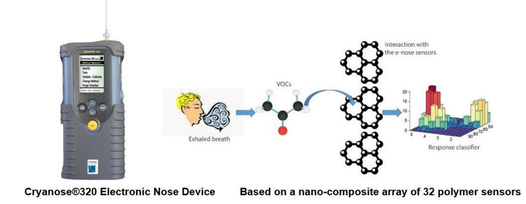


Fig 2A. A schematic view of the workflow of CTC isolation and immunostaining. The CTCs were isolated using the RosetteSep™ method. CTCs were enriched during standard density gradient centrifugation using Lymphoprep™ as a density gradient medium. The isolated CTCs were then subjected to immunofluorescence staining using a panel of antibodies against CK, CD45, and CSV for characterisation.



Cryanose®320 Electronic Nose Device — Based on a nano-composite array of 32 polymer sensors

Fig 2B. A schematic view of the working principle of the Cyranose 320 device. The collected breath sample is analysed. It is based on a nano-composite array of 32 organic polymer sensors. When exposed to VOC combinations in our breath samples, the polymers swell, thereby modifying their electrical resistance. Raw data are registered as the increase in resistance of any single sensor, and the combination of all signals results in a "breath print".

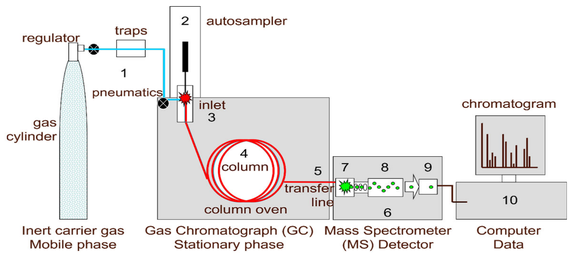


Fig 2C. A simplified diagram of a gas chromatograph–mass spectrometer showing (1) carrier gas, (2) autosampler, (3) inlet, (4) analytical column, (5) interface, (6) vacuum, (7) ion source, (8) mass analyzer, (9) ion detector and (10) PC. The breath samples were analysed for potential VOCs using GC-MS.

Results

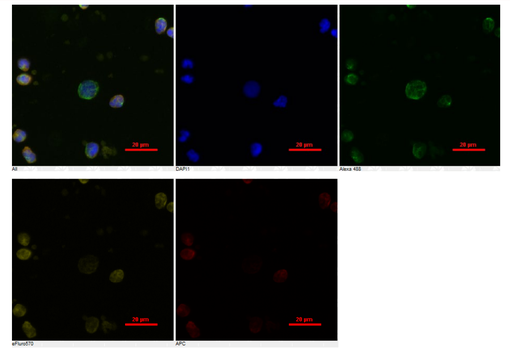


Fig 3A. CTCs were identified as CK-positive, CSV-positive, DAPI-positive cells, and CD45-negative cells that were larger than 5 µm and had intact cell membranes. Cells that stained positive for CD45 and DAPI and negative for pan-cytokeratin and pan-CSV were classified as white blood cells and were consequently excluded from the study. We detected CTCs in 70-75 % of patients with malignant lung nodules, demonstrating the potential clinical value of this test.

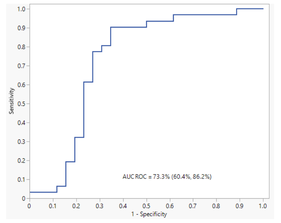


Fig 3B. By analysing eNose data, we achieved an AUC ROC Value of 73.3 % for differentiating benign from malignant nodules.

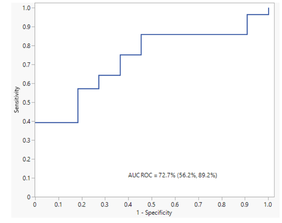


Fig 3C. The GC-MS data also yielded an AUC ROC Value of 72.7 % for differentiating benign from malignant nodules.

Conclusion

- By combining data from breath and blood tests with clinical information, we have established a preliminary nodule diagnostic score distinguishing benign from malignant lung nodules.

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

Determining accuracy of performing a neurological examination via telehealth in patients with low back pain

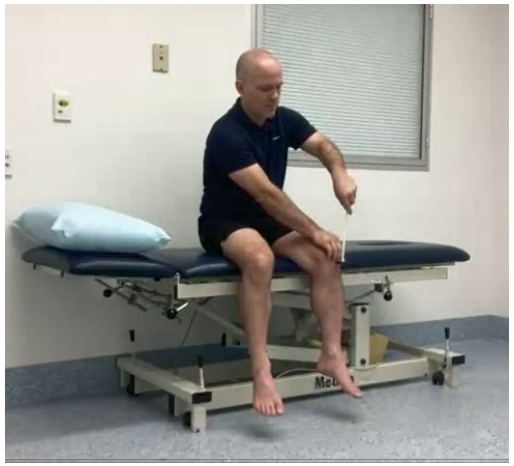
Cottrell M[1] , Swete-Kelly P[1] , Raymer M[2] , Rowley O[1] , Hockey M[1] , Featherston S[1] , Window P[1] , Loch-Wilkinson T[1] , O'Leary S[1,3]

1. RBWH; 2. State-wide MPSC&MDS; 3. UQ SHRS

Aim: Determine agreement between in-person and telehealth neurological exam in the context of inter-rater agreement for an in-person exam.

Methods: 38 adults with low back pain-related symptoms completed a standardised neurological examination (strength, sensation, reflexes, long tract signs) by telehealth and in-person. A second in-person exam was completed by 18 participants.

Results: Similar agreement was observed between modes and between in-person exams for most long tract tests, though lower between modes for the heel walk (PABAK[95%CI]: 0.22[-0.13-0.54] vs. 0.67[-0.17-0.93]) and Hoffmans test (PABAK[95%CI]: 0.55[0.18-0.81] vs. 0.76[0.27-0.97]). Reflex testing showed poor to fair agreement between modes (PABAK -0.03–0.33) and moderate to substantial agreement between in-person examination (PABAK 0.44–0.67). Strength tests had mostly lower agreement between modes compared to between in-person exam, though poor agreement was also observed for two myotomes (L2, S1) between the in-person exams.



Conclusion: Neurological exam via telehealth for appears comparable to in-person examination for some tests. Tests with poorer agreement potentially reflects both the acknowledged challenges of telehealth (e.g. visualisation, patient administered tests) and test interpretation (relevant for both modes). Caution is recommended when interpreting results, particularly for tests with low incidence of an abnormal response.

Scan the QR code to access the examination proformas

Educational or Behavioural Interventions to Improve Long-term Haemodialysis Vascular Access Self-management: A Systematic Review

Colette WEMBENYUI[1,2], Nicole MARSH[1,3], Emily LARSEN[1,3], & Ann BONNER[1,2]

[1]School of Nursing and Midwifery Griffith University, Queensland, Australia; [2] Kidney Health Service, Royal Brisbane Women's Hospital; [3]Nursing and Midwifery Research Centre, Royal Brisbane Women's Hospital

Background

Haemodialysis (HD) is the most frequently used kidney replacement therapy globally[2]. To provide HD, access to the vascular system through a native arteriovenous fistula, arteriovenous graft or central venous catheter is required[1,3]. Vascular access complications are a major cause of morbidity and mortality in the HD population, and effective vascular access self-management is required.

Aim

To examine the effectiveness of educational or behavioural interventions designed to improve self-management of long-term vascular access in adults receiving HD.

Methods

- PubMed, Embase, CINAHL, Cochrane Library, PschINFO and JBI were searched for English language publications from January 2013 to May 2023
- 3376 studies were identified, two reviewers independently screened the studies, appraised studies and extracted data
- Prospectively registered in PROSPERO (CRD42023414193)

Results

Seven studies involving 540 participants were included; two studies were randomised control trials and five were quasi-experimental. All studies involved patient education, predominately provided by nurses, and employing a variety of teaching resources such as education booklets, practical demonstrations and videos. Education interventions varied from three to eight sessions; session times ranged from 15 minutes to one hour, delivered over a period of two weeks to three months (Table 1). The self-management assessment tools varied among the studies. Outcomes measured included vascular access self-management behaviours, self-efficacy, and vascular access knowledge, and results revealed significant improvements post educational interventions. However, none of the studies provided pre-dialysis vascular access self-management education.

Table 1: Teaching Plan for Education Interventions

Author/Year	Intervention duration	Number of sessions	Length of each session	Educator	Mode of delivery	Timing of intervention	Post-intervention follow-up
Borzou et al. (2020)	2 weeks	3	30 - 45 mins	Researcher	Individual face-to-face teach-back, small group discussion	After HD treatment	1 month
Fadlalmola & Ekareem (2020)	3 months	Not reported	Not reported	Nurse	Education program	Not reported	6 months
Li & Yin (2021)	>3 months	Not reported	Not reported	Nurse	Group education sessions	Not reported	3 months
Liu et al. (2016)	Not reported	Not eported	Not reported	Nurse	Face-to-face group discussions with individualised information, if necessary	Not reported	6 months
Ramezani et al. (2019)	2 weeks	4	1 hour	Researcher	Face-to face group training sessions	Non-dialysis days	3 months
Sousa et al. (2021)	2 days (theory)	6	30 mins	Researcher	Face-to-face group presentations	Before HD session	3 months
	2 weeks (practical)	2	15 mins	Nurse and Researcher	Interactive small group training sessions	At the start HD sessions	
Trask et al. (2016)	Not reported	Not reported	Not reported	Nurse	Face-to face education	During HD treatment	1 year

Conclusion

Educational interventions led to improvements in self-management behaviours in adults with long-term HD vascular access. However, there was insufficient evidence for the delivery and duration of intervention education. Further research is needed.

Implications for Practice

- High quality evidence-based studies on educational or behavioural interventions are urgently needed
- Education should begin before the creation of vascular access and then reinforced afterwards
- Principles of co-design could be used to develop person-centred strategies
- It is important to be able to measure the level of self-management
- Appropriate training be provided to dialysis nursing staff about teaching vascular access self-management

References

1. Agarwal, A. K., Boubes, K. Y., & Haddad, N. F. (2021). Essentials of vascular access for home hemodialysis. Advances in Chronic Kidney Disease, 28(2), 164-169. https://doi.org/10.1053/j.ackd.2021.06.008
2. Bello, A. K., Okpechi, I. G., Osman, M. A., Cho, Y., Htay, H., Jha, V., Wainstein, M., & Johnson, D. W. (2022). Epidemiology of haemodialysis outcomes. Nature Reviews Nephrology, 18(6), 378-395. https://doi.org/10.1038/s41581-022-00542-7
3. Canaud, B., Ponce, P., Parisotto, M. T., Busink, E., Apel, C., Rammo, J., & Stuard, S. (2019). Vascular access management for haemodialysis: A value-based approach from nephrocare experience. In Vascular Access Surgery - Tips and Tricks. IntechOpen. https://doi.org/doi: 10.5772/intechopen.84987

Evaluating the appropriateness of liposomal amphotericin B, caspofungin and voriconazole prescriptions in adult haematology and haematopoietic stem cell transplant patients

McGowan A [1], Landrigan O [2], Firman P [1], Kennedy G [1]

[1] Royal Brisbane And Women's Hospital [2] Queensland University of Technology

Background

Haematology and haematopoietic stem cell transplant (HSCT) patients are at high risk of fungal infections and require prompt treatment. However, the inappropriate use of antifungals can result in increased microbial resistance, unnecessary costs, adverse events, and unnecessary exposure. Three antifungal agents were evaluated at our unit: liposomal amphotericin B (LAmB), caspofungin and voriconazole.

Aim

To assess appropriateness of antifungal selection and dose, to quantify adverse drug reactions (ADR), and to assess appropriateness of drug level monitoring.

Method

A single-centre, retrospective audit covering the period January 2021 to December 2021 was conducted at a metropolitan quaternary hospital in Australia. Medical records were reviewed for haematology and HSCT inpatients prescribed LAmB, caspofungin or voriconazole. Data was collected in Microsoft Excel and presented descriptively. The project was a quality improvement initiative and received an ethics exemption.

Results

There were 59 patients with 122 prescriptions for antifungals between January 2021 and December 2021. Indication was appropriate in 91% (n=111/122) of prescriptions versus 37% (n=25/67) for dosing. One third of prescriptions were appropriate for both indication and dose (33%, n=22/66). Voriconazole had the highest incidence of ADRs (4%, n=4/94). Voriconazole levels were within therapeutic range for 42% (n = 8/19) of new prescriptions.

*Appropriateness of **antifungal selection** by agent and indication*

	Appropriate		Indication Appropriate				
	n	%	*Empiric, n =15*	*Pre-emptive, n=22*	*Primary, N=17*	*Secondary, N=46*	*Targeted, N=22*
LAmB, n=14	10	71%	1	6	0	1	2
Caspofungin, n=14	14	100%	2	2	8	0	2
Voriconazole, n=94	87	93%	10	12	4	44	17
Total, n=122	111		13	20	12	45	21
Total, %		**91%**	87%	91%	71%	98%	95%

*Appropriateness of **dose** by agent and indication*

	Appropriate		Indication				
	n	%	*Empiric, n =15*	*Pre-emptive, n=21*	*Primary, N=12*	*Secondary, N=6*	*Targeted, N=13*
LAmB, n=14	11	79%	2	6	0	1	2
Caspofungin, n=14	5	36%	1	2	1	0	1
Voriconazole, n=39	9	23%	2	4	1	0	2
Total, n=67	25	37%	5	12	2	1	5
Total, %			33%	57%	17%	17%	38%

Conclusion

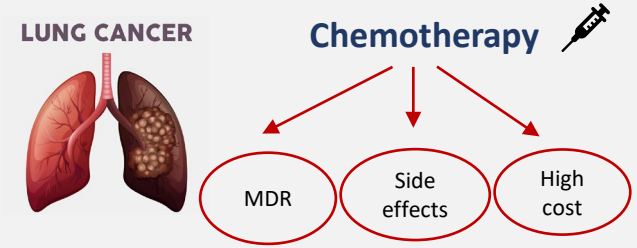
The audit showed a low proportion of adherence to dosing recommendations, but indication was mostly compliant with guidelines. Liposomal amphotericin B, caspofungin, and voriconazole were well-tolerated among this patient cohort. Future local guideline updates will address dosing variation in practice.

Development and characterization of lipid polymer hybrid nanoparticles containing ivermectin as a potential repurposed anticancer drug

Seyedeh Negin Kassaee[1], Derek Richard[2], Godwin A. Ayoko[3], Nazrul Islam[1]

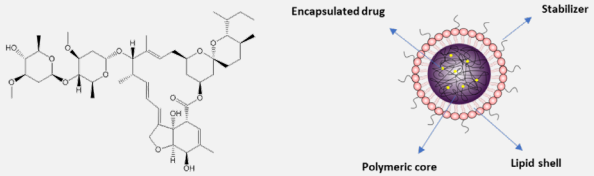
1. Pharmacy Discipline, School of Clinical Sciences, Faculty of Health, Queensland University of Technology (QUT), Brisbane, QLD, Australia
2. Centre for Genomics and Personalised Health, School of Biomedical Sciences, Queensland University of Technology (QUT), Brisbane, QLD, Australia
3. School of Chemistry and Physics and Centre for Materials Science, Queensland University of Technology (QUT), Brisbane, QLD, Australia

Introduction



Novel treatment strategies

Ivermectin



The aim of this study is to develop and characterize ivermectin-loaded lipid polymer hybrid nanoparticles (LPHNPs) against lung cancer.

Methods

- Single-step emulsion solvent evaporation
- Physicochemical properties
- Drug Loading and Entrapment Efficiency
- In Vitro Drug Release
- Solid phase characterization

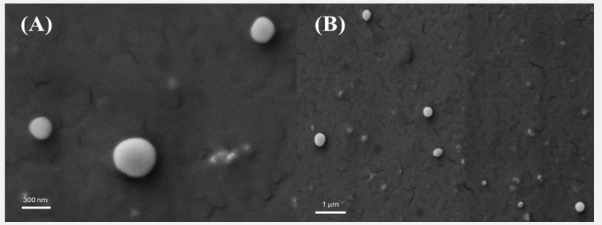
Formulation	PCL (mg)	Lecithin (mg)	Pluronic F127 (%w/v)	IVM (mg)
F1	45	30	0.25	6
F2	45	45	0.25	6
F3	45	60	0.25	6
F4	45	30	0.5	6
F5	45	30	0.75	6

Results

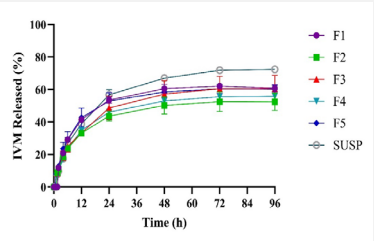
- Desirable nanometric particle size
- Monodisperse size distribution
- Proper stability due to high zeta potential
- High entrapment efficiency
- Prolonged release profile
- Successful entrapment of ivermectin in LPHNP as proved by DSC and FTIR
- Good thermal stability of drug when loaded in LPHNPs

Formulation	Particle Size (nm)	Polydispersity Index (PDI)	Zeta Potential (mV)	Entrapment efficiency %
F1	350.70 ± 16.04	0.32 ± 0.06	-32.03 ± 1.36	80.59 ± 0.93
F2	320.34 ± 14.81	0.28 ± 0.04	-34.16 ± 1.25	75.40 ± 1.56
F3	303.51 ± 17.24	0.37 ± 0.03	-33.47 ± 1.63	71.65 ± 1.54
F4	323.01 ± 7.244	0.42 ± 0.07	-37.98 ± 1.94	74.64 ± 2.01
F5	350.75 ± 27.57	0.38 ± 0.09	-38.82 ± 1.69	68.32 ± 1.62

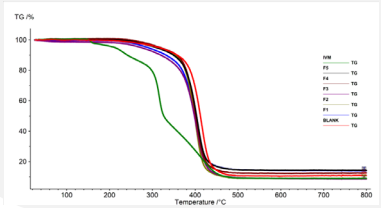
SEM



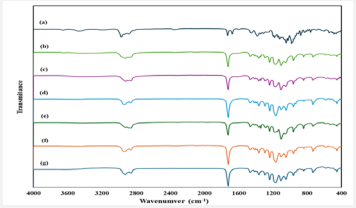
Release



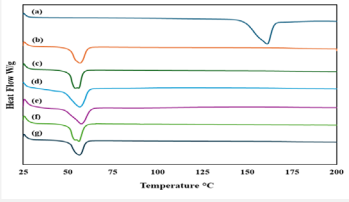
TGA



FTIR



DSC



Conclusion

- We stablished an efficient and feasible method to develop IVM loaded LPHNPs
- Developed formulations revealed proper physicochemical properties
- IVM loaded LPHNPs could be good candidates for battling against lung cancer

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

Boosting Usage of Sodium Chloride 0.9% 1L bags – A Vital Standing Order

Ashley, S[1], McFarland, S[1], Pham-Nguyen, A[2], Davies, K[1,4], Losinski, K[1], O'Brien, E[3], Best, G[3], Sweeney, B[2], Coetzee, R[2], Craighead, K[3], McGrath, N[3], Hodges, S[3] McCourt, E[1]

1 Clinical Pharmacology RBWH 2. Pharmacy Department, RBWH 3. Internal Medicine and Emergency Services, RBWH 4. Herston Infectious Disease Institute

PURPOSE

Conduct a snapshot audit of **Sodium Chloride 0.9% 1L bag** and burette use via the **Standing Order.**

BACKGROUND

The use of **Sodium Chloride 0.9% 1L bag** and burette for intravenous (IV) medication is current best practice. Sodium Chloride 0.9% 100mL bags are often used in place of the **recommended Sodium Chloride 0.9% 1L bags** for intravenous administration. This choice incurs

- High fluid costs (5 x the cost)
- Environmental waste
- Potential infection risk

METHODS

Pre-implementation audit August 2023 (n=28)

Standing Order implemented (COM-B model) February 2024 (2 trial wards)

Post-implementation audit February-April 2024 (n=176)

Medication charts screened for IV medications. Data collected from patients notes and medication charts
Patient transport procedure 01526 amended May 2024 for Sodium Chloride 0.9% fluids

RESULTS

60% eligible patients
Administered IV medication via 1L bag
(36% pre-implementation)

2 in 10 eligible patients
Administered 1L bag via **Standing Order**

NIL associated medication safety incidents (RiskMan)

Eligible Patients: Must be on trial ward receiving intermittent IV medications >2 doses. Must not be fluid restricted

PROJECTED COST SAVINGS*

	100mL bag (all patients)	1L bag (50% uptake^)	1L bag (all patients)	SAVINGS (100% uptake)
Cost per day	$2940	$1776	$612	$2328
Cost per year	$1,073,100	$648,152	$223,205	$849,720

*Based on 330 Medical and Surgical beds ^Target of 50% of eligible patients administered IV medications via 1L bag via Standing Order and 50% of patients on 100mL bag

LIMITATIONS

- National fluid shortage
- Patient transport procedure 01526 (amended May 2024)

CONCLUSION

The **Standing Order** has **increased 1L bag usage** for medication administration. This represents improvement in:

- Clinician time
- Cost effectiveness
- Environmental wastage

Potential facility wide cost savings

$425-850K/YEAR

Education and facility wide implementation is recommended with further evaluation to determine impact of patient transport policy amendments on 1L bag uptake.

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

Empowering ‘NEWSTART’ nurses & midwives by facilitating professional connection and career progression

AIM To empower ‘newstart’ nurses and midwives to identify and work through challenging situations by implementing realistic strategies with professional guidance to a positive outcome.

*Dr Helen Donovan (QUT); Kresta Davenport & Gill Nasato (MN)

CONCERN

‘NEWSTARTS’ 2023 reporting:

- Teamwork connection anomalies
- Professional identity obscurities
- Career progression ambiguities
- Increasing attrition rates from the workforce

PLAN

Provide a cohesive QUT/MN support structure to all NEWSTARTS at RBWH & TPCH, by:

- Introducing the ‘N/M supporting N/M’ program at all ‘newstart’ orientation sessions at RBWH & TPCH for 2024;
- Provide contact phone numbers and email addresses to both of the mentors (Gillian Nasato MN/Dr Helen Donovan QUT);
- Newstarts formally invited to 6 weekly mentoring ‘catchups’ at both facilities to provide confidential guidance & sustenance.
- Follow up with those ‘newstarts’ who identify as needing unique support and guidance.

PROGRESS DATA

- Orientation sessions attended - RBWH (19); TPCH (11)
- Newstart connections – RBWH (494 nurses); TPCH (276 nurses)
- Formal Mentoring ‘catchups’ – RBWH (5); TPCH (4)
- Newstarts at mentoring sessions - RBWH (31 nurses); TPCH (12 nurses)
- Independent contacts - (6 nurses)

Reported ‘Newstart’ PROBLEMS 2024

- Workloads too large
- Support challenges
- Incivility/bullying behaviours
- Unreasonable expectations
- Difficulties with rapid change

CHALLENGES for the program.

Engagement with participants.

- Alerting & empowering ‘newstart nurses and midwives’ to attend mentoring sessions;
- Facilitating opportunities for ‘newstart nurses and midwives’ to be released from the clinical areas to attend the mentoring sessions;
- Gaining support from senior nurse leaders to actively encourage attendance.

GOING FORWARD.

- Increase advertising campaigns;
- Enable clinical environments to release ‘newstarts’ for mentoring catchups;
- Each clinical area to initiate a ‘newstart’ champion to facilitate the program and be an onsite mentor.

QUT Metro North Nursing and Midwifery Academy.

SPHERE 1. Professional and Clinical Excellence. **“Nurses and Midwives SUPPORTING Nurses and Midwives”**

*h.donovan@qut.edu.au

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

Deadly feet: a co-design process for the implementation of a multi-disciplinary outreach.

Metro North Health and Deadly Feet acknowledge the Traditional Custodians of the land upon which we work and deliver our services – more specifically the Turrbal, Yaggera, Gubbi Gubbi, Kabi Kabi, Wakka Wakka, Butchulla people. We pay our respects to Elders past present emerging with a special mention to the Elders who have guided the codesign of Deadly Feet.

Authors: Annette Redhead, Teal Derboghossian, Laeticia Douglas, Ry Abel, Jordan Smith, Murray Ogg, & Jason Jenkins

Background: Deadly Feet is a co-designed, multi-disciplinary vascular outreach service delivered across multiple sites. It operates in collaboration with Hospital and Health Services (HHS), Institute of Urban Indigenous Health (IUIH), Moreton Aboriginal and Torres Strait Islander Community Health Services (MATSICHS) and Galangoor Duwamali Primary Healthcare Service, Cherbourg Regional Aboriginal and Torres Strait Islander Community Controlled Health Service (CRIACCHS) and local Aboriginal and Torres Strait Islander community and health teams. The success of Deadly Feet would not be as noteworthy without the support of local Aboriginal and Torres Strait Islander peers, community organisations and mob who have guided the design, implementation and evaluation of the program.

Purpose: Deadly Feet aims to improve clinical pathways and outcomes for Aboriginal and Torres Strait Islander people at risk of or with foot disease through early detection, risk modification and intervention by addressing the known barriers Aboriginal and Torres Strait Islander people face accessing healthcare. This is achieved by delivering podiatry, vascular sonography, and vascular specialist services to patients in a culturally appropriate manner, closer to home and with the additional support of an Identified workforce.

Methods: Deadly Feet's success stems from its collaboration with an extensive co-design network that extends beyond QLD Health and guides the service's design, implementation, and evaluation. Through yarning and shared knowledge, Deadly Feet gained a deeper insight into community needs as well as barriers to healthcare access. These insights led to valuable recommendations that enhanced the care model, including:

- Identified workforce to provide extensive patient support
- Community engagement and opportunistic screening arm
- Service provided closer to home
- Ability to receive self-referrals & minimal referral criteria
- Patients reviewed by 3 specialists within one appointment
- Assistance with transport to and from appointment

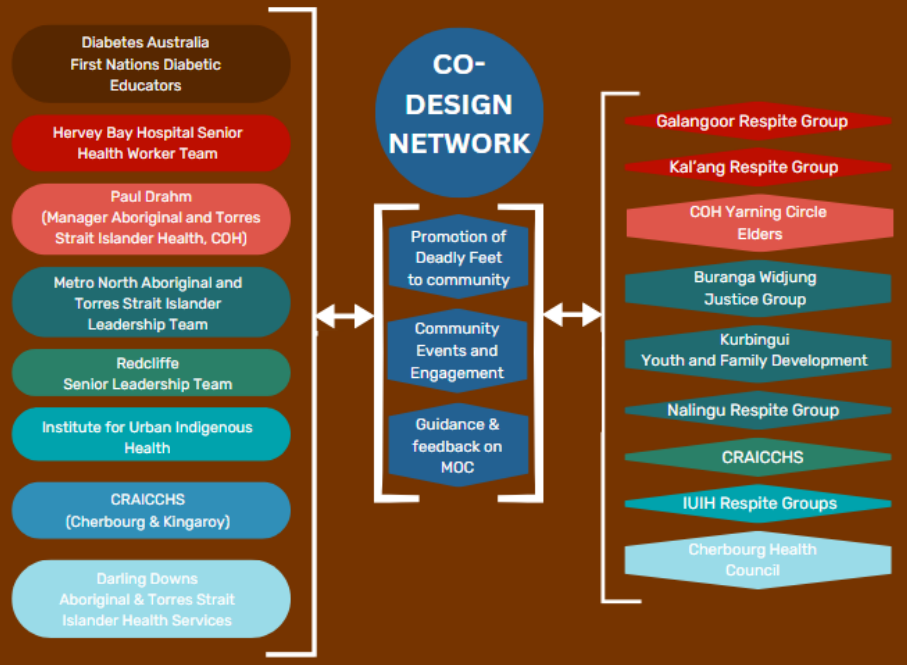


Figure 1: Metro North Deadly Feet co-design network framework schematic

Results: Deadly Feet has 4 established clinic sites: Redcliffe Hospital, Caboolture MATSICHS, Galangoor Duwalami Hervey Bay and CRAICCHS Cherbourg. To date, Deadly Feet has received 356 referrals into the service and reviewed 274 patients. Additionally, Deadly Feet has attended 25 community events at which 252 community members opted to participate in screening. Of these, 82 self referred into Deadly Feet for formal review.

Figure 2: Metro North Deadly Feet team at a community engagement event with attendees.

Conclusion: Actively engaging with consumer ideas and community feedback is the cornerstone of Deadly Feet's success as a culturally responsive model. Over the next 12 months, Deadly Feet aims to strengthen its partnerships as well as explore opportunities for further expansion, all while remaining guided by the voices of the Aboriginal and Torres Strait Islander communities it serves.

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

Technology-enhanced, group-based (TEG) model of hand therapy management versus usual care following carpal tunnel release surgery: A feasibility and pilot randomized controlled trial

STARS Education and Research Alliance
CREATING KNOWLEDGE | TRANSFORMING CARE

Mrs Emma Taylor[1], Prof Trevor Russell[2], Dr Emma Ballard[3], Prof Haitham Tuffaha[4], Dr Mohammadreza Amiri[4], Mrs Tamsin Mahoney[1], Semele Robinson (consumer), Dr Ridzwan Namazie[1], Prof Nadine Foster[5], Mrs Caroline Wegrzyn[1], Dr Emmah Doig[5]

[1]Surgical Treatment and Rehabilitation Service (STARS), Herston, QLD, Australia, [2]RECOVER Injury Research Centre, The University of Queensland, QLD, Australia, [3]QIMR Berghofer Medical Research Institute, Herston, QLD, Australia, [4]Centre for the Business and Economics of Health, The University of Queensland, QLD, Australia, [5]STARS Education and Research Alliance, Herston, QLD, Australia

BACKGROUND

Carpal Tunnel Syndrome is the most common entrapment neuropathy & results in high volume carpal tunnel release (CTR) surgeries. Usual hand therapy post CTR is in-person, one-to one therapy. Technology-enhanced, group-based hand therapy (TEG) has the potential to increase efficiency and access, reduce costs, and meet demand.

AIMS

1. Determine acceptability and feasibility and describe the outcomes and costs of the TEG model compared to usual care
2. Determine feasibility of a future larger RCT that could determine the clinical and cost-effectiveness of the TEG

Inclusion Criteria

- Clinical diagnosis CTS (by treating surgeon) and listed for open CTR surgery at STARS
- Aged ≥18 years old
- Able to understand English

Exclusion Criteria

- Other surgery in conjunction with CTR
- Atypical CTS (ie. pre-existing conditions)
- Prior hand/wrist surgery within last 6 months
- Unable to attend in-person, one-to-one therapy at STARS
- No access to smart phone or computer
- Unable to provide consent

METHODS

Single-centre assessor-blinded feasibility and pilot RCT. Consumer co-investigator with lived experience involved project and grant development, co-creation of intervention components and patient facing material, analysis and dissemination.

MEASURES

Acceptability & Feasibility

- Acceptability of Intervention Measure (AIM)
- Feasibility of Intervention Measure (FIM)
- Patient adherence (appointments & home program)
- SEAR (screened, eligible, approached, randomized)
- Patient experience (open-ended survey)

Outcomes

- Boston Carpal Tunnel Questionnaire (BCTQ)
- Patient Specific Functional Scale (PSFS)
- Numerical Rating Scale (NRS) for pain

Costs

- Direct healthcare costs (intervention time & costs)
- Participant Costs (travel time & costs, time off work)

1st appt : 10-14 days postop
- suture removal
- education
- ex's (6 pack, wrist, MN glides)
- scar management (scar massage & silicone)

Home therapy program

2nd appt : 6 weeks postop
- review of progress
- strengthening ex's (theraputty)

Interventions

USUAL CARE
1st appt – **one-to-one, in-person**
Home program – **paper-based**
2nd appt – **one-to-one, in-person**

TEG
1st appt – **group-based (n = 1), in-person**
Home program – **app-based (video-guided**, reminders)
2nd appt – **one-to-one, Telehealth**

RESULTS

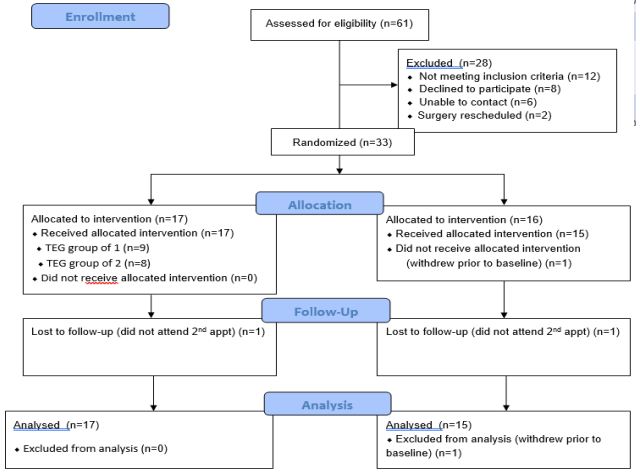
Acceptability, Feasibility, Adherence and Cost

AIM: TEG M=4.33 and usual care M=4.38 (out of 5)

FIM: TEG M=4.47 and usual care M=4.43 (out of 5)

Adherence: Appointment attendance 97% in both groups. Home program adherence TEG = 91%; Usual care = 97%

Cost: mean cost per participant for TEG was $68 compared to $110 for usual care. (NOTE: As only 8/17 TEG participants could be allocated to a group format (4 groups of 2), the costs for TEG are likely less compared to if all TEG participants had received group format.



Patient Experience

GROUP FORMAT: Comfortable with group format and valued peer sharing and support.

APP-BASED HOME PROGRAM: Easy and convenient: '*easy to follow and can do it anywhere'.*

TELEHEALTH FOLLOW-UP: time efficient, easy and convenient.

Exploratory Clinical Outcomes

Measure	TEG			Usual care			Difference in change (TEG – Usual care)
	Pre	Post	Change	Pre	Post	Change	
	Mean (SD)	Mean (SD)	Mean (95% CI)	Mean (SD)	Mean (SD)	Mean (95% CI)	Mean (95% CI)
BCTQ total	26 (8)	18 (3)	-9 (-13, -5)	29 (10)	21 (7)	-10 (-13, -6)	1 (-4, 6)
PSFS average	4 (2)	7 (2)	3 (1, 5)	3 (3)	6 (1)	4 (2, 5)	-1 (-3, 2)
Pain (VAS)	3 (2)	2 (2)	-1 (-2, 0)	4 (2)	3 (3)	-1 (-2, 0)	0 (-2, 1)

CONCLUSIONS

TEG model of hand therapy post CTR was both feasible and acceptable to patients.

TEG is potentially cost-saving for the health service.

A future larger RCT is warranted to determine clinical and cost-effectiveness.

FUNDING: HP Research Scheme grant

CONTACT: emma.taylor@health.qld.gov.au

HERSTON HEALTH PRECINCT SYMPOSIUM 2024

Feasibility study to compare taste changes and dietary intake in patients with head and neck cancer according to genetically determined Taster Status

Teresa E Brown[1, 2] | Liang-Dar Hwang[3] | Elise Treleaven[1] | Anita Pelecanos[4] | Brett G M Hughes[5,6] | Charles Y Lin[5,6] | Lizbeth M Kenny[5,6] | Penny Webb[4] | Judith D Bauer[7,2]

[1]Department of Nutrition and Dietetics, Royal Brisbane and Women's Hospital, Herston, Brisbane QLD, 4029 Australia | [2]School of Human Movement & Nutrition Sciences, The University of Queensland, St Lucia, Brisbane QLD 4072 Australia | [3]Institute for Molecular Bioscience, The University of Queensland, St Lucia, Brisbane QLD 4072 Australia | [4]QIMR Berghofer Medical Research Institute, QLD, Australia | [5]Cancer Care Services, Royal Brisbane and Women's Hospital, Herston, Brisbane QLD, 4029 Australia | [6]School of Medicine, The University of Queensland, St Lucia, Brisbane QLD 4072 Australia | [7]Department of Nutrition, Dietetics and Food, Monash University, Notting Hill, VIC 3168

Aims

Patients with head and neck cancer (HNC) undergoing chemoradiation often experience loss or alteration of taste which impacts oral intake and increases malnutrition risk. An individual's inborn "taster status" is primarily determined by genetic variation within the bitter taste receptor gene TAS2R38. This taster status has been shown to affect the perception and consumption of food in healthy populations, however, has never been investigated in cancer patients. .

Methods

Patients with HNC cancer undergoing curative intent chemoradiation were eligible. Taster status was determined using kits supplied by Monell Chemical Sense Center, USA (Figure 1). Taste perception, nutritional status (PGSGA) and dietary intake (online 24-hr recall ASA-24) were measured at baseline, and 1-, 3- and 6-months post-treatment. Primary outcomes were feasibility measures (recruitment and retention rates; acceptability of assessment tools), with clinical secondary outcomes (nutritional and taste).

Figure 2: Change in Energy Intake (kJ) over time between Tasters and Non-Tasters

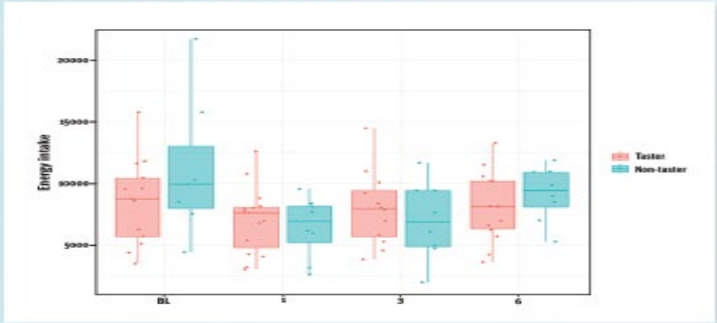
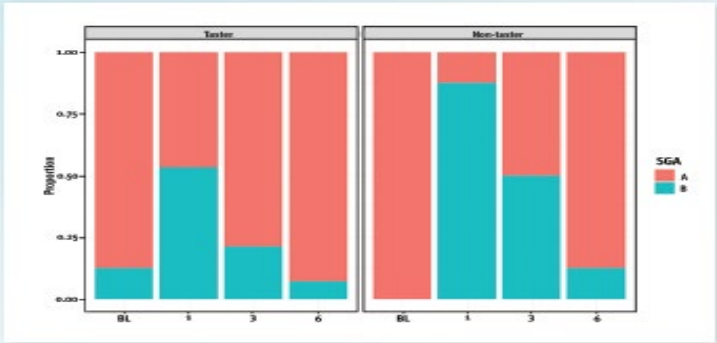


Figure 3: Change in Nutritional Status (SGA) over time between Tasters and Non-Tasters



Results

Twenty-four patients enrolled; 92% male, mean age 63.1(SD 9.4) years. Most (92%) had oropharyngeal cancer. All had concurrent chemoradiation. Eight (33%) were classified as non-tasters. Only two patients withdrew. All patients easily completed taste assessments and PGSGA (median 9-10/10). The online 24-h recall was rated more difficult (5-7/10) with lower completion rates (83-96%).

At 1-month, 70% and 83% of patients correctly identified sweet and salty respectively, however was lower for sour (48%), bitter (52%), cool (43%) and burn (65%). Taste perceived intensity improved over 6-months, although sour remained low (36%). Taster patients had steadier energy and protein intakes over time, whereas non-tasters experienced the greatest decrease in intake at 1-month and were slower to recover (Figure 2). Non-tasters had higher rates of malnutrition at 1-month (88% vs 53%) and 3-months (50% vs 21%) (Figure 3).

Conclusions

Study design was feasible and assessment tools were acceptable. Non-tasters appear to have greater impacts from chemoradiation on their oral intake and nutritional status compared to tasters which warrants further investigation.

Grantley Stable Neonatal Unit – Royal Brisbane and Womens' Hospital

Developmental dysplasia of the hip screening – A single centre retrospective review

Peterson T[1], Davies M[1], Lai M[1]
[1]Grantley Stable Neonatal Unit, Royal Brisbane and Women's Hospital, Herston, Brisbane, Queensland, Australia

Background

Developmental dysplasia of the hip (DDH) is a disorder of abnormal hip joint development, where early diagnosis and management can prevent significant long term complications. This study sought to explore the role of clinical based and risk-factor based screening practices and review outcomes for patients identified in this process. Moreover, we sought to propose an alternate screening process to optimise use of hospital resources without impacting patient outcomes.

Methods

We retrospectively reviewed hip ultrasound reports and the electronic medical record for indication for screening, patient outcomes and DDH rates for a 3-year period (2019-2021) in the single centre tertiary neonatal unit in the RBWH.

Results

Of 838 infants who underwent ultrasound screening (USS) for DDH, 30 (3.6%) required treatment (harness, brace or surgery). Of patients requiring treatment, 8 (26%) were detected through screening alone, whilst 22 (74%) were identified from positive clinical signs during hip examination.

Breech was the most common risk factor in 626 (74.7%) of infants, followed by family history in 151 (18%) of infants. Infants referred for screening for clinical concerns (113, 13.5%) had the highest rate requiring treatment for DDH. The greatest risk factor for DDH requiring treatment were female infants who delivered vaginally with breech presentation.

For patients requiring treatment for DDH, 24 (92%) of 26 patients had hips considered normal post treatment.

Conclusion

Clinical examination and targeted ultrasound screening to detect DDH in the newborn is effective. In this large tertiary centre review, the incidence of early onset DDH was 2.1/1000 with a treatment rate of 3.6%. A proposed streamlined screening process may reduce unnecessary scans, without increasing adverse outcomes. Validation on subsequent cohorts and further PDSA cycles are required prior to implementation.

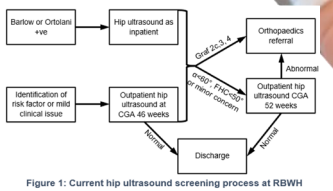


Figure 1: Current hip ultrasound screening process at RBWH

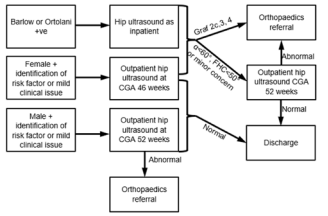


Figure 2: Proposed alternative DDH ultrasound screening process

Cohort details for patients with DDH risk	
Total hip ultrasounds	1084
Total patients	838
Female patients	453 (54.1%)
Male patients	385 (45.9%)
Breech risk factor	626 (74.7%)
Family history risk factor	151 (18.0%)
Clinical examination risk factor	113 (13.5%)

Table 1: Details of DDH ultrasound screened patients at RBWH (2019-2021)

Outcomes for patients with abnormal ultrasounds			
	Requiring repeat ultrasound (with normal outcome)	Requiring harness or brace (but not surgery)	Requiring surgery
All patients	130 (15.5% of cohort) +18 lost to follow up	26 (3.1% of cohort)	4 (0.5% of cohort)
Female	82 (63%) +14 lost to follow up	20 (4.6% of females) 12 had clinical signs[1]	3 (0.7% of cohort) 3 had clinical signs[1]
Male	48 (37%) +4 lost to follow up	6 (1.6% of males) 6 had clinical signs[1]	1 (0.3% of cohort) 1 had clinical signs[1]

Table 2: Outcomes for patients with abnormal ultrasounds

[1] These patients clinical signs were significant with dislocated, dislocatable or subluxable hips

Improving the Rate of Disease Modifying Anti-Rheumatic Drug (DMARD) Tapering in Patients with Rheumatoid Arthritis at Royal Brisbane and Women's Hospital (RBWH): Results of a Quality Improvement Initiative

Eliza Pearson[1] Georgina Sneddon[1], Karen Hay[3] and Ashleigh Hennessey[1].

[1]Rheumatology Department, Royal Brisbane and Women's Hospital [3]QIMR Berghofer Research Institute

Purpose

To determine the impact of a quality improvement intervention on rates of DMARD tapering amongst patients with Rheumatoid Arthritis within the Rheumatology Department at the RBWH.

Methods

Initial Audit (March 2022)
- Data Collection:
  - Demographics, Role of Care Provider, Appointment Modality, Disease Activity
- Identify Patients Eligible for DMARD Tapering
  - Remission: Joint Count = 0, Inflammatory Markers within Normal Range
  - Remission Sustained for Minimum 6 months

Intervention (October 2023)
- Results Presented at RBWH Rheumatology In-Service
- Scope for Improvement Outlined

Follow-up Audit (October 2023)
- Re-audit of data
- Analysis to identify if rates of DMARD tapering improved

Results

In the pre intervention data collection period, 21 out of 124 patients (16.9%) were identified as eligible for a dose reduction. Of the 21 eligible patients, 1 patient (4.8%) was offered a dose reduction, 5 other patients were offered dose reduction despite not meeting our definition of remission. Reasons for not tapering were not recorded and may have been clinically justified.

Repeat audit was undertaken in the 4 weeks following intervention. 25 patients were eligible for DMARD tapering. 5 out of 25 patients underwent tapering (20%), an additional 6 patients were also offered taper. P-values from Fisher's Exact test did not support a statistically significant increase in DMARD tapering post intervention.

Conclusion

An audit of tapering practices and enacting Departmental intervention identifying scope for enhancement numerically improved the rate of DMARD de-escalation in patients with RA in sustained remission at RBWH. This 15.2% observed increase in DMARD tapering post intervention did not meet statistical significance.

	March 2022	October 2023	p-value
RA Patients Reviewed	124	103	
Tender Swollen Joint Count = 0	67 (58.8%)	62 (64.6%)	0.39
Inflammatory Markers Normal	40 (47.1%)	52 (61.2%)	0.065
Eligible for Taper	21 (16.9%)	25 (24.3%)	0.17
Eligible for Taper and Offered Tapering	1 (4.8%)	5 (20.0%)	0.20
Offered Tapering Despite not being in Remission	5 (4.9%)	6 (7.7%)	0.43
Total Offered Tapering	6 (4.8%)	11 (10.7%)	**0.096**

Optimised intraoperative dosing regimens for intravenous lidocaine in patients with obesity

Angela Tognolini[1,2], Xin Liu[3], Saurabh Pandey[3], Jason Roberts[3,4,5,6], Steven Wallis[3], Dwane Jackson[1,2], Victoria Eley[1,2]

1. Department of Anaesthesia and Perioperative Medicine, Royal Brisbane and Women's Hospital, Australia. 2. Faculty of Medicine, The University of Queensland, Australia. 3. The University of Queensland Centre for Clinical Research, Australia. 4. Departments of Pharmacy and Intensive Care Medicine, Royal Brisbane and Women's Hospital, Australia. 5. Herston Infectious Diseases Institute (HeIDI), Metro North Health, Australia. 6. Division of Anaesthesiology Critical Care Emergency and Pain Medicine, Nîmes University Hospital, University of Montpellier. Nîmes, France.

Background

Intraoperative lidocaine infusions may improve postoperative pain and recovery by minimising opioid consumption [1]. There is little evidence to guide lignocaine dosing in patients with obesity. We aimed to measure plasma concentrations of lidocaine and develop a pharmacokinetic model and optimised dosing regimen.

Method

Ethics approval and informed consent (HREC/2018/QPCH/43981) was obtained. A standardised intravenous lidocaine regimen was administered to patients with a BMI >30 kg/m^2 undergoing elective laparoscopic abdominal surgery at the RBWH. Based on lean body weight (LBW) [2], a 1.5 mg/kg bolus (maximum 100 mg) over 10 minutes, followed immediately by an infusion of 1.5 mg/kg/h, was administered intraoperatively for the duration of surgery. Arterial blood was sampled during and after the infusion. Plasma concentrations of lidocaine, and its active metabolites monoethylglycinexylidide (MEGX) and glycylxylidide (GX), were measured using liquid chromatography-mass spectrometry at the UQCCR. Patient characteristics and baseline biochemistry data were collected. Analysis and a pharmacokinetic model was developed using Monolix. Dosing simulation were performed using Simulx to develop a regimen that best achieved therapeutic plasma concentrations between 2.5 to 5 µg/ml [3].

	Total (n=30)
Age (years)	50.5 (32-76)
Sex (female)	21 (70%)
Body Mass Index (kg/m^2)	37.7 (30.2-58.4)
Total Body Weight (kg)	107 (80-189)
Lean Body Weight (kg)	55.7 (43.9-90.9)
Comorbidities – Cardiovascular – Respiratory – OSA – Diabetes	18 (60%) 12 (40%) 15 (50%) 17 (58%)
Albumin (g/l)	39 (33-46)
AAG (mg/ml)	0.6 (0.2-1.4)
Total Lidocaine Dose (mg)	230.5 (144.7-580.3)

Table 1. Patient characteristics. Values are median and range, or total number and percentage (%).

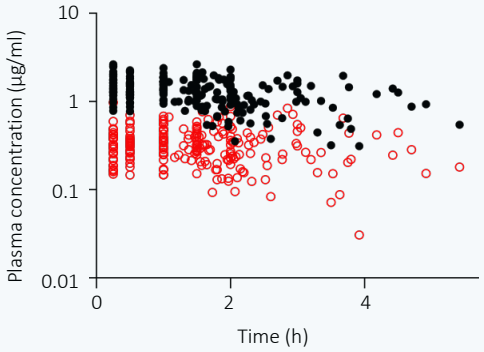


Figure 1. Observed total (●) and unbound (○) plasma concentrations of lidocaine.

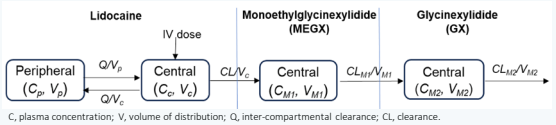


Figure 2. Schematic diagram of the pharmacokinetic model.

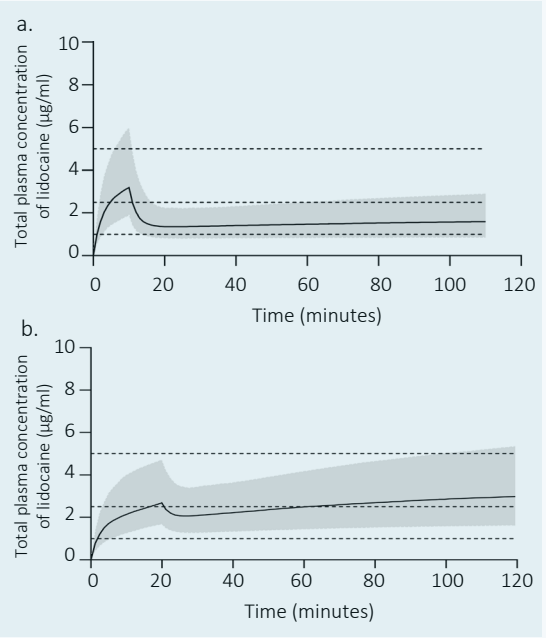


Figure 3. Predicted plasma concentrations for simulated regimen of *a*. 1.5 mg/kg bolus over 10 mins and 1.5 mg/kg/h, and *b*. 2 mg/kg bolus over 20 mins and 3 mg/kg/h infusion.

Results

Thirty patients provided 221 plasma samples. Patient characteristics are shown in *Table 1*. Twenty-one (70%) patients underwent surgery for weight loss, and the median (range) surgical time was 91.5 (55-231) minutes. Using the total and unbound plasma concentrations of lidocaine (*Figure 1*), MEGX and GX, a four-compartment model was developed (*Figure 2*). Lidocaine Vd was 2.2 L/kg and CL was 1.7 L/kg/h. Dosing simulations revealed currently used doses had a low probability of target attainment (PTA) (*Figure 3a*). A bolus of 2 mg/kg over 20 mins, followed by an infusion of 3 mg/kg/h based on LBW improved PTA from 0 to 20% (*Figure 3b*).

Conclusion

Our simulated dosing regimen more optimally achieved and maintained safe therapeutic concentrations in this obese population. Further studies will evaluate the clinical efficacy of this dosing regimen in obese patients undergoing laparoscopic abdominal surgery.

Acknowledgements

2020 ANZCA Project Grant Scholarship. 2019 and 2020 RBWH Research Postgraduate Scholarships.

References

[1] Weibel S, et al. Cochrane Database of Syst Rev. 2018; 6(6):CD009642.
[2] Janmahasatian S, et al. Clin pharmacokinet. 2005;44(10):1051-65.
[3] Eipe N, et al. BJA Edu. 2016;16(9):292-8.

Developing Custom Photogrammetry Equipment for Design, Manufacturing and Quality Assurance of Personalised Medical Devices

Peter Storeshaw, Liam Georgeson, Isabel Byram, Roozbeh Fakhr, Dr Dan Yuan, Dr David Forrestal

Background:

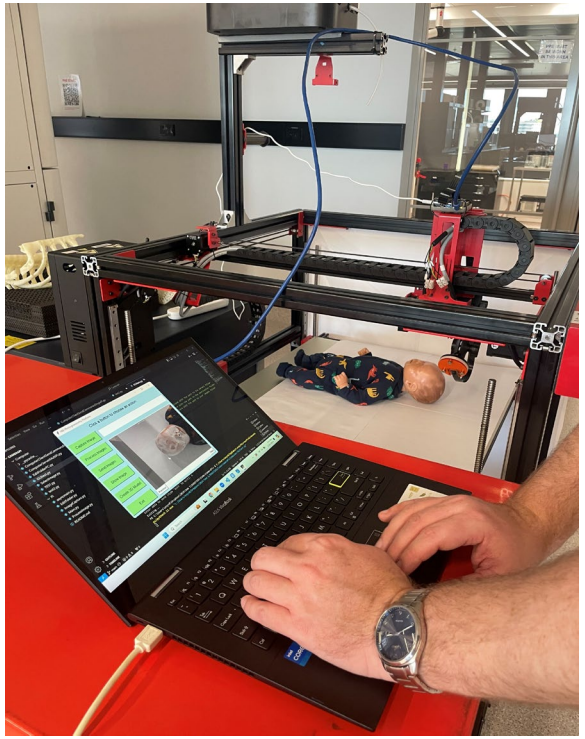
The use of 3D models in medical applications is becoming more and more common place. External 3D models of patients and biomedical devices are typically made using handheld 3D scanners. However, the trade-offs for the flexibility of these devices are low accuracy and difficulty in capturing 3D models for specific medical applications.

Aims:

Create and test the feasibility of a modular photogrammetry system that can create 3D models of biomedical applications where current scanning techniques are insufficient.

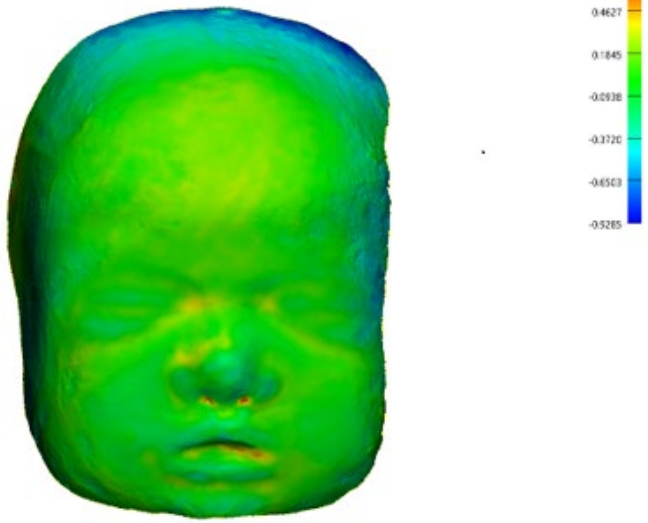
Methods:

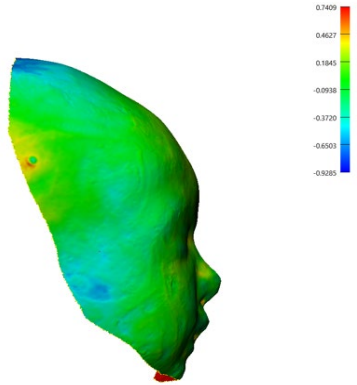
- Two Raspberry PI with two PI cameras were used to create a single module and connect to a laptop.
- The program was created using python and open-source libraries.
- Program can automatically crop and rotate images as well as remove blurred images.
- Different photogrammetry programs were tested and custom workflow pipelines where created that produced 3D model files that were easy to manipulate.
- Testing was undertaken on a Modix Big 60 3D printer, allowing a single camera to act as any number of cameras for still objects.
- Object type, materials, lighting, camera numbers, image orientation, surface sprays, capture pattern and pixel count were all tested.



Results:

- The device can capture images near simultaneously (less than 200ns).
- Extra modules can be added without the need to additional code.
- Resultant model requires some scaling in this initial stage.
- Device can capture an image set and create a 3D model in less than 20 minutes.
- Model has an average of 0.3mm deviation on focused areas of the object.





Conclusions:

- Proof of effectiveness of photogrammetry with < 30 images on small biomedical objects.
- Complete code, instruction manuals and automated pipeline created.

Future Work:

- Improve reconstruction quality with use of different lighting conditions, improved camera quality and added depth information.
- Create calibration protocols.
- Adhere to regulations and standards

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

A SCOPING REVIEW OF FALL-RISK SCREENING TOOLS IN THE EMERGENCY DEPARTMENT FOR FUTURE FALLS IN OLDER ADULTS

Daniel Wickins, Jack M Roberts, Steven M McPhail, Nicole M White

PURPOSE

To examine the scope of published studies on fall-risk screening tools used in the emergency department (ED) and evidence of associations between screening and future falls in older adults presenting to the ED.

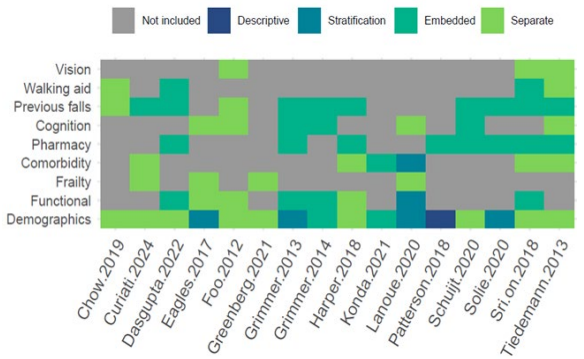
METHODS

PubMed, Embase and CINAHL were searched for peer-reviewed journal articles published since 2012 that examined one or more screening tools to identify patient-level fall risk. Eligible studies described fall-risk tools applied in the ED. Data extracted included sample information, variables measured and statistical analysis.

RESULTS

- Fifteen articles were included after full-text review.
- Studies comprised validated ED fall-risk screening tools and tools validated in non-ED settings.
- Studies that evaluated prognostic performance generally reported sensitivity higher than specificity.
- Previous falls and high-risk medications were consistently associated with future falls.
- Augmentation with additional variables from the electronic medical record (EMR) improved screening tool performance in one study, improving Area Under the Receiver Operating Curve (AUC) from 0.64 to 0.75.

COVARIATES INCLUDED IN STUDIES



CONCLUSION

- Current evidence on the association between the use of fall-risk screening tools in the ED for future falls consistently identifies previous falls and high-risk medications as associated with future falls.
- Comparison between tools is difficult due to different evaluation methods and different covariates measured. Augmentation of fall-risk screening using the EMR in the ED requires further investigation.

Are patients seen in The Royal Brisbane and Women's Hospital Preadmission Clinic becoming more complex?

Ingrid Stroud[1], Kate Murphy[1], Eloise Glover[1], Katharine Dekker[1], Abby Yu[1]
1.Royal Brisbane & Women's Hospital

Background

The opening of the Surgical, Treatment and Rehabilitation Service (STARS) in February 2021 within Metro North Hospital and Health Service has resulted in the utilisation of The Royal Brisbane and Women's Hospital (RBWH) as a tertiary referral centre. STARS provides services to low comorbidity patients that are for low complexity, elective, short stay surgical procedures, and who do not require postoperative high dependency unit support. Anecdotally the complexity of patients being seen in the RBWH preadmission clinic (PAC) has increased since the opening of STARS. Medically complex patients are more likely to be taking a greater number of medications, including high-risk (i.e. APINCH) medications that may require intervention peri-operatively. There is currently a lack of information as to how complex and resource-demanding any one of the patient's regimens may be for the PAC pharmacist.

Aim

To characterise the complexity and perioperative planning of patients undergoing elective surgery at The Royal Brisbane and Women's Hospital before and after the opening of STARS.

Method

A retrospective audit of patients reviewed in the RBWH preadmission clinic between May 1st-31st 2020 (pre-group) and May 1st-31st 2023 (post-group) was conducted. Data captured included surgery type, comorbidities, American Society of Anaesthesiologists (ASA) score, number of regular and 'when required' or PRN medications the patient takes, number of high-risk medications each patient is taking (modified APINCH), any specialist consultations made pre-operatively and pharmacy recommendations made regarding the medications pre-operatively.

Results

Data for 52 patients from each group was collected. The Mean age in both groups was 63 years. Median ASA score was higher in the post-group (ASA 3 vs 2). Mean number of regular medicines taken was higher in the post-group (8 vs 6). The mean number of when required medications was higher in the post group (3 vs 2). The percentage of patients taking anticoagulants was higher in the post group (23% vs 2%). 83% of patients in the post-group were taking at least one high-risk medicine vs 71% in the pre-group.

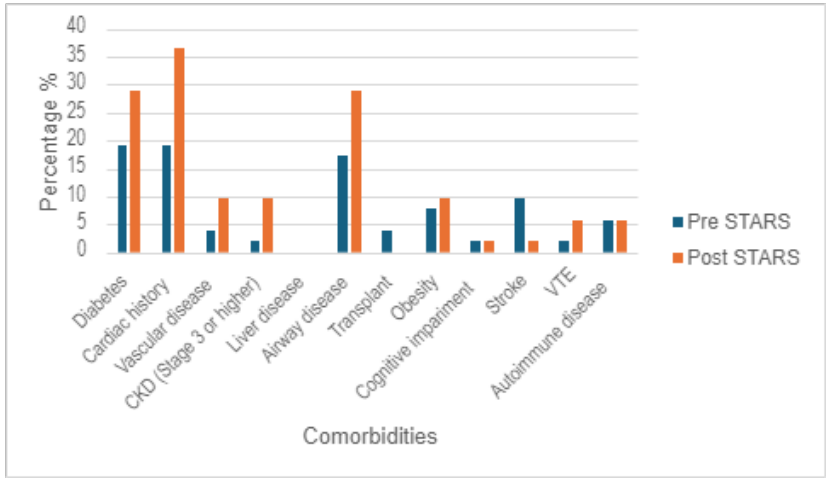
Conclusion

The complexity of patients seen in the RBWH preadmission clinic has increased since the opening of STARS. These findings indicate an increased workload for clinicians. Based on these preliminary findings, increased resourcing in the preadmission clinic and across the surgical service of the hospital is warranted.

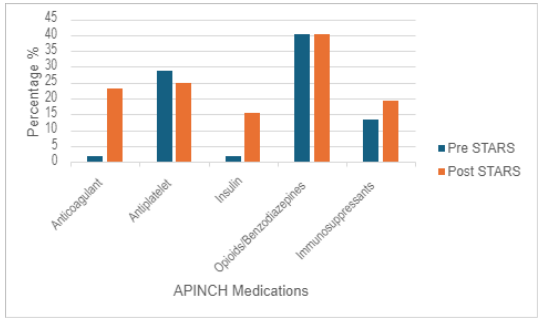
Table 1 – Patient Demographics

Demographics	Pre		Post	
Age (Mean ± SD)	62.6 ± 15.8		62.7 ± 14.9	
Biological sex	**Frequency**	**Percent**	**Frequency**	**Percent**
Male	34	65.4	25	48.1
Female	18	34.6	27	51.9
Total	52	100	52	100
ASA score				
<3	26	50	12	23.1
≥3	24	46.2	39	75
Missing	2	3.8	1	1.9
Total	52	100	52	100
Surgical team				
Burns	1	1.9	2	3.8
General surgery	2	3.8	0	0
Neurosurgery	5	9.6	1	1.9
Plastics	20	38.5	7	13.5
Surg 1	5	9.6	5	9.6
Surg 2	3	5.8	14	26.9
Surg 3	1	1.9	13	25
Surg 4	5	9.6	3	5.8
Urology	10	19.2	7	13.5
Total	52	100	52	100

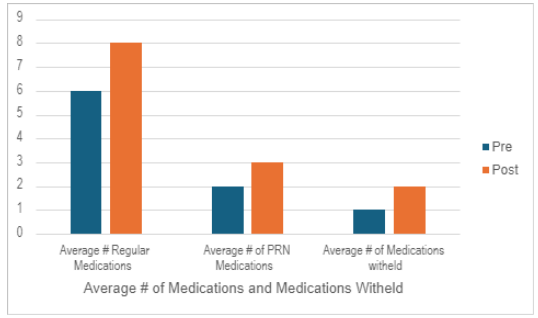
Graph 1 – Comparing Comorbidities Pre and Post STARS



Graph 2 – APINCH Medications Pre and Post STARS



Graph 3 – Comparing Average number of Medications and Withheld Medications Pre and Post STARS



Access to Physiotherapy for patients with Parkinson's Disease attending the Royal Brisbane and Women's Hospital Movement Disorder Clinic

Beth Cunningham[1], Lindsay Hepnar[1], Dr Robyn Lamont[2], Prof Sandy Brauer[2], Assoc. Prof John O'Sullivan[3], Dr Robert Adam[3], Dr Matthew Katz[3], Shayani Upadhyay[3], Jasmine De Oliveira[3], Dr Peter Window[1]

Background

Early physiotherapy assessment and intervention is critical to maintaining functional independence and reducing the risk of falls and subsequent hospital admissions for people with Parkinson's Disease. It is unclear if individuals with Parkinson's Disease are accessing sufficient, appropriate, and timely physiotherapy.

Aims

1. Determine current referral to, and uptake of, physiotherapy services for individuals with Parkinson's Disease
2. Identify current barriers and enablers to accessing physiotherapy services
3. Develop specific strategies to improve referral and uptake of physiotherapy

Methods

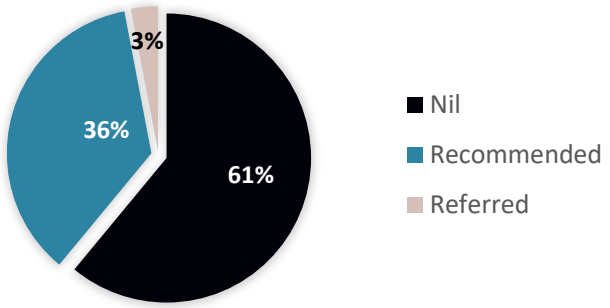
A two-stage sequential mixed-methods study design was undertaken. Stage 1 involved a retrospective chart audit (n=80) of patients with Parkinson's Disease to identify documented recommendations of physiotherapy services. Following this, phone interviews were conducted to gain the patient's perspective and determine if physiotherapy services had been accessed. Stage 2 involved focus groups with clinicians and patients, to further explore barriers and enablers to accessing physiotherapy and identify strategies to improve the issues identified.

1. Physiotherapy Dept, RBWH
2. School of Health and Rehabilitation Sciences, University of QLD
3. Neurology Dept, RBWH

For further information contact
beth.cunningham@health.qld.gov.au

Results

From medical records we found that 49 (61%) people with Parkinson's Disease were not referred to or recommended to seek physiotherapy. Of those where physiotherapy was not recommended (39%), most (71%) had reason/s to benefit from physiotherapy.



Indication for Physiotherapy	Prevalence
Falls/balance issues	57.5%
Prevent functional decline	37.5%
Difficulty with transfers	21.25%
Pain	16.25%
Difficulty with gait/ freezing	15%
Difficulty with ADLs	5%
Dizziness	2.5%

Most patients did not access physiotherapy early following diagnosis and referral to physiotherapy was generally only considered when patients started to experience falls and/or gait disturbance. Most patients who were recommended physiotherapy had accessed these services and most reported at least one fall in the last 12 months.

Three major themes were identified as factors contributing to a decreased access to physiotherapy:
(1) clinician knowledge, skills, and time
(2) Individual patient factors
(3) limited publicly funded services that meet the needs of patients with Parkinson's Disease.

Conclusions

Access to physiotherapy for individuals with Parkinson's Disease is limited and tends to occur later in the disease process. Understanding the factors that influence referral and uptake of physiotherapy and developing strategies to address these will improve the care we provide to patients with Parkinson's Disease.

Adherence of CT Head Requests in First Episode Psychosis to the Choosing Wisely Canada™ Guidelines: Potential for Optimisation of Resources.

Victor Do[1], Kerry Conner[1] , Krishna Pranathi Settipalli[1], Karen Dobeli[1]
[1]Department of Medical Imaging, Royal Brisbane and Women's Hospital, Herston, QLD, 4006

Introduction:

Non contrast CT of the head is used as a screening tool in first episodes of psychosis (FEP) to rule out an organic cause for the patient's condition. Recently published studies suggest screening head CT is overutilised in the setting of FEP.

ChoosingWiselyCanada™ Guidelines recommend: "Don't routinely order brain neuroimaging (CT or MRI) in first episode psychoses in the absence of signs or symptoms suggestive of intracranial pathology. Signs and symptoms suggestive of intracranial pathology include headaches, nausea and vomiting, seizure-like activity, and later-age of onset of symptoms."

Aim:

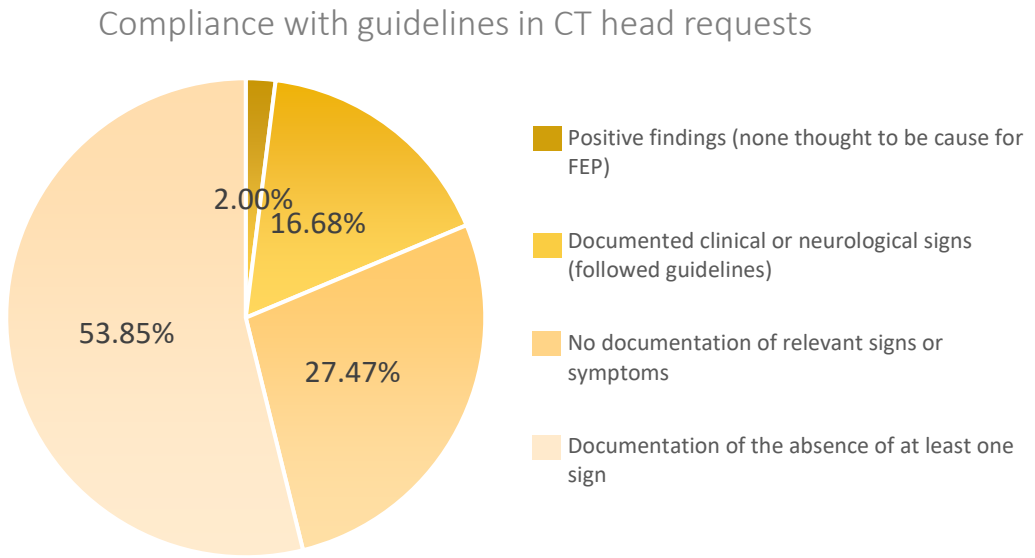
The aim of this clinical audit was to determine how well requests for CT Head in FEP at the Royal Brisbane and Women's Hospital (RBWH) met the *ChoosingWiselyCanada*™ guidelines.

Methods:

A retrospective review of Karisma® database was conducted to identify all CT head scans performed on adult Mental Health inpatients between 23rd April 2018 and 9th March 2022 to screen for an organic cause of FEP. The patients' medical records were reviewed to determine the documented neurological signs or symptoms on presentation that met the *ChoosingWiselyCanada*™ criteria for CT imaging for FEP. Additionally, the reports of the CT scans were reviewed to identify any positive findings.

Results:

- CT head as a screening tool in FEP has a very low (2%) diagnostic yield. Additionally, the positive findings in our cohort, although they followed the guidelines, were all deemed not to be the cause of the patient's FEP.
- The majority of requests (81.4%) did not following the *ChoosingWiselyCanada*™ guidelines.



Conclusion

Adherence to the *ChoosingWiselyCanada*™ guidelines with more comprehensive documentation of clinical signs and symptoms, such as with the use of a checklist at the RBWH, could lead to a significant reduction in unnecessary CT head requests and increase the diagnostic yield in detecting an organic cause for FEP.

Changes in non-formulary medicine approvals at a quaternary public hospital over time

Panteha Voussoughi[1], Elizabeth McCourt[1,2], Peter Donovan[1]

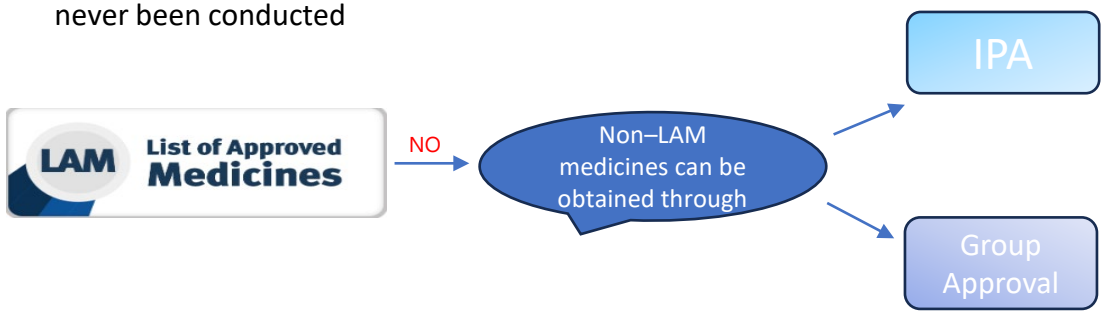
1. RBWH |2. Centre for Clinical Research, UQ

Purpose:

- Queensland Health (QH) has a state-wide list of approved medicines (LAM) - this formulary dictates what medications can be prescribed in QH facilities
- Department of Clinical Pharmacology (DCP) at RBWH review applications for use of non-formulary medications - referred to as individual patient approvals (IPAs)
- A deep dive of previous IPAs has never been conducted

Methods:

- A retrospective database review on the IPAs submitted from January 2018 to December 2023.
- The IPA database was reviewed and cleaned for spelling errors and formulation variations.
- Data analysed descriptively and compared annually for the project period

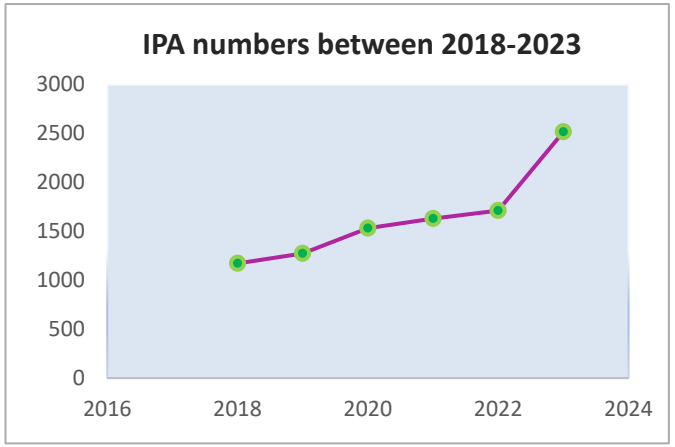


Results:

- 7,328 of IPAs were submitted to DCP during this period.
- The number of IPAs submitted increased annually.
  - There was a 114% increase in IPAs submitted between 2018 and 2023
- The number of products has increased
  - 2018 = 240
  - 2023 = 400
- The most frequently requested items have changed:
  - 2018 - bevacizumab, rituximab and budesonide
  - 2023 - buprenorphine, mirabegron and melatonin

Conclusions:

- Demand on the DCP for IPA approvals has increased over the years
- Increase in variation of medications requested
  - demonstrates the complexity of medication products that require individual assessment
- This can inform changes to the IPA process including creating new group approvals



Exploring consumer involvement in Critical Appraisal Topic (CAT) groups to ask and answer clinical questions using research evidence

STARS Education and Research Alliance
CREATING KNOWLEDGE | TRANSFORMING CARE

L Anemaat[1,2], D Copland[1,2], J Quicke[1], NE Foster[1], E Doig[1]
[1]Surgical Treatment and Rehabilitation Service (STARS) Education and Research Alliance, Metro North Health and The University of Queensland,
[2]Queensland Aphasia Research Centre, School of Health and Rehabilitation Sciences, The University of Queensland.

FUNDING: *Health Translation Queensland Micro grant*
CONTACT: *lisa.anemaat@health.qld.gov.au*

Background

- Critically Appraised Topics (CAT-groups): rapidly appraise evidence to answer clinical questions, for translating evidence into practice.
- CAT-groups have been exclusively conducted by clinicians and researchers.
- We believe, this fails to address clinical questions important to consumers.
- However, research informing how to meaningfully involve consumers is limited.

Aim: To explore and codesign with consumers, how to meaningfully embed their involvement in CAT-groups.

Methods

3 Critically Appraised Topic (CAT) groups

- *3 trials with consumers involved*

Task analysis of 7 steps in STARS CAT-groups

1. *To which steps do consumers add value?*
2. *What supports or changes are needed for consumers to be involved?*

Co-design workshop to create modified model

Participants

Researchers (n=2)
Consumers (n=3)

Results

Consumers should contribute across 5 steps:

- Proposing / choosing topics (*patient experience*)
- Formulating the question (*modified PICO*)
- Making sense of the evidence (*modified CASP*)
- Determining recommendations (*simplified evidence summary*)
- Writing summary report (*plain English summary*)

Co-designed new *Collaborative-CAT-Group* model

Conclusions

Further research is needed to implement and evaluate the modified CAT-group process.

STARS CAT-Group steps

1. **Proposing / choosing topics**
2. **Formulating the question**
3. **Searching/ choosing relevant literature**
4. **Appraising chosen evidence**
5. **Making sense of the evidence**
6. **Determining recommendations**
7. **Writing summary report**

Figure 1. CAT-group steps, red boxes indicate identified steps where consumers feel the value of their contributions are most significant

Systematic Review on the resting state fMRI in Parkinson's disease and cognitive impairment

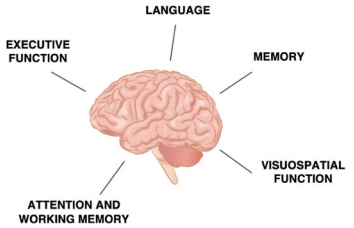
Jihyun Yang[1], A-Jin Jennifer Kim[1], Dinu Ranatunga[1], Dana Pourzinal[1], Nadeeka Dissanayaka[1,2,3]

[1]UQ Centre for Clinical Research, The University of Queensland, Brisbane, Australia
[2]Department of Neurology, Royal Brisbane & Women's Hospital, Brisbane, Australia
[3]School of Psychology, The University of Queensland, Brisbane, Australia

INTRODUCTION

Cognitive impairment is now recognised as an important non-motor symptom in Parkinson's disease (PD) and predicts dementia development. Despite its detrimental impact on patients' quality of life and contribution to a high disease burden, the underlying neural mechanism of cognitive impairment and its subtypes in PD has yet been fully elucidated.

The clinical profile for cognitive impairment in PD is heterogeneous and can affect cognitive domains.



A systematic review is conducted to identify altered functional connectivity between brain regions and networks during resting state fMRI (rs-fMRI) contributing to various cognitive subtypes in PD.

METHODS

- **4 databases** PubMed, Scopus, Embase and PsycINFO were searched.
- **Search terms used:** (Parkinson*) AND ('resting state' OR rest*) AND (fMRI OR 'functional magnetic resonance imaging') AND ('global cognit*' OR memory OR visuospatial OR executive* OR attention OR 'working memory' OR cognit* OR dementia).
- **Studies were only included if they:** 1) were written in English, 2) involved idiopathic PD patients, 3) performed fMRI during resting state and 4) used cognitive measures.
- Studies compared PD with mild cognitive impairment (PD-MCI) to healthy controls (HC), PD with normal cognition (PD-CN) and/or PD with dementia (PDD).

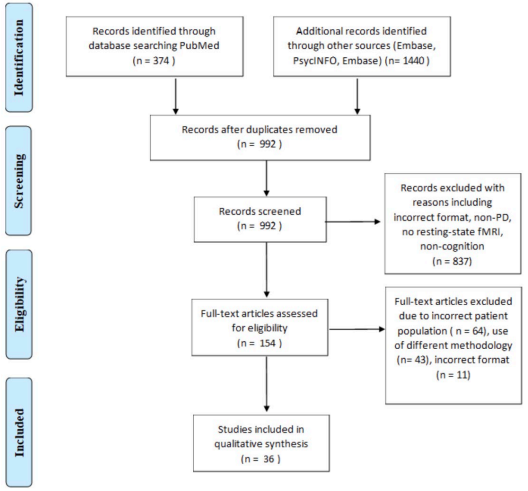


Figure 1: PRISMA Flow Diagram

RESULTS

Database searches 1814 records (Fig 1). A total of 154 records were read in full text from which 118 were excluded. 36 articles included in this review.

Movement Disorder Society (MDS)'s Level I and II criteria are currently used to diagnose PD-MCI amongst researchers and clinicians.[1]

- Mini-Mental State Examination (MMSE) and/or Montreal Cognitive Assessment (MoCA) was used to assess global cognition
- Various neuropsychological tests used to assess the 5 cognitive domains

Studies were divided according to the cognitive domain tested and study-specific information, Levodopa equivalent daily dose (LEDD), MDS Level and main study findings were recorded (Table 1-6). Note: * compared to PD-NC, ** compared to HC, *** compared to PDD

Compared to HC and PD-CN, PD-MCI consistently showed altered FC within the Default Mode Network (DMN), associated with global and all domain-specific cognitive impairments. The Fronto-Parietal Network (FPN) and Dorsal Attention Network (DAN) FC in PD-MCI also correlated with executive function and attentional impairments, respectively. However, inconsistent findings in FC patterns across different cognitive domains in PD-MCI still remain.

GLOBAL

AUTHOR, YEAR	SUBJECTS	LEDD	MDS LEVEL	MAIN FINDING
Chen, 2017	10 PD-MCI, 19 PD-NC, 13 HC	Unk	I	PD-MCI showed decreased FC in posterior cingulate cortex (PCC) and bilateral precuneus** (positive correlation)
Chiang, 2018	12 PDD, 13 PD-MCI, 16 PD-NC, 29 HC	OFF	II	PD-MCI showed increased FC between medial temporal lobe (MTL)-medial occipital lobe (MOL)*** (positive correlation)
Zhan, 2018	9 PDD, 9 PD-MCI, 9 PD-NCI, 9 HC	ON	I	PD-MCI showed increased FC between PCC-posterior cerebellum* (positive correlation) and increased FC between PCC-precuneus* (negative correlation)
Gargouri, 2019	20 PD-MCI, 32 PD-NC, 25 HC	ON	I	PD showed decreased FC between Ch3-4 of the basal forebrain and the right inferior frontal gyrus and bilateral thalamus** (positive correlation)
Li, 2019	25 PD-MCI, 25 PD-NC, 25 HC	ON	I	PD-MCI showed decreased marginal division (MrD) FC with the right putamen, left insula, left thalamus, and left cerebellum* (positive correlation), and increased MrD FC with the left middle cingulate cortex (MCC), left superior frontal gyrus (SFG), left supplementary motor area (SMA), left middle/inferior occipital gyrus (MOG/IOG) and left middle frontal gyrus (MFG)* (negative correlation)
Li, 2020	33 PD-MCI, 36 PD-NC, 22 HC	ON	I	PD-MCI showed increased thalamus FC with bilateral MCC and left PCC* (negative correlation), and decreased thalamus FC with left superior occipital gyrus (SOG), MOG, cuneus, precuneus* (positive correlation)
Palmer, 2020	6 PDD, 23 PD-MCI, 28 PD-NC, 30 HC	OFF	Unk	PD showed increased cSMN FC with bilateral precentral gyrus, post-central gyrus, and SMA** (negative correlation), and increased cDAN FC with right postcentral gyrus and precentral gyrus** (positive correlation)
Zarifkar, 2021	18 PD-MCI, 9 PDD, 23 PD, 19 HC	ON	II	PD-MCI showed decreased FC between left hippocampus (LHC) and right hippocampus (RHC)*, ** (positive correlation)

Table 1: 8 seed-based studies on global cognition

VISUOSPATIAL FUNCITON

AUTHOR, YEAR	SUBJECTS	LEDD	MDS LEVEL	MAIN FINDING
Bezdicek, 2019	16 PD MCI, 18 PD-NC, 31 HC	ON	II	PD-MCI showed decreased FC between the anterior hippocampi and precuneus/superior parietal cortex** (positive correlation)
Zhang, 2020	22 PD-MCI, 22 PD-NC, 22 HC	OFF	II	PD-MCI showed decreased FC in the basal nucleus of Meynert (right superior parietal lobe)*, ** (positive correlation)
Zarifkar, 2021	18 PD-MCI, 9 PDD, 23 PD, 19 HC	ON	II	PD-MCI showed decreased FC between LHC-RHC*, ** (positive correlation)
Pan, 2022	25 PD-MCI, 13 PD-NC, 17 HC	Drug-naïve	II	PD-MCI showed increased right dorsal anterior insular (dAI) FC with the right MCC and paracingulate gyri (PCG)** (negative correlation)

Table 2: 4 seed-based studies on visuospatial function

EXECUTIVE FUNCTION

AUTHOR, YEAR	SUBJECTS	LEDD	MDS LEVEL	MAIN FINDING
Gargouri, 2019	20 PD-MCI, 32 PD-NC, 25 HC	ON	I	PD showed decreased FC between Ch3-4 of the basal forebrain and the right inferior frontal gyrus and bilateral thalamus** (positive correlation)
Zarifkar, 2021	18 PD-MCI, 9 PDD, 23 PD, 19 HC	ON	II	PD-MCI showed decreased FC between LHC-RHC*, ** (positive correlation)
Pan, 2022	25 PD-MCI, 13 PD-NC, 17 HC	Drug-naïve	II	PD-MCI showed increased FC between left dAI and right superior parietal gyrus (SPG)* (negative correlation)
Jiang, 2023	25 PD-NC, 8 PD-MCI, 22 HC	OFF	II	PD showed increased FC between right lobule VII of the cerebellum and bilateral lingual gyrus** (negative correlation)

Table 3: 3 seed-based studies on executive function

LANGUAGE

AUTHOR, YEAR	SUBJECTS	LEDD	MDS LEVEL	MAIN FINDING
Zarifkar, 2021	18 PD-MCI, 9 PDD, 23 PD, 19 HC	ON	II	PD-MCI showed decreased FC between LHC-RHC*, ** (positive correlation)
Pan, 2022	25 PD-MCI, 13 PD-NC, 17 HC	Drug-naïve	II	PD-MCI showed increased FC between the left dorsal anterior insular (dAI) and the right superior parietal gyrus (SPG)* (negative correlation)

Table 4: 2 seed-based studies on language function

MEMORY

AUTHOR, YEAR	SUBJECTS	LEDD	MDS LEVEL	MAIN FINDING
Hou, 2016	14 PD-MCI, 18 PD-NC, 22 HC	Drug-naïve	II	PD-MCI showed decreased FC between hippocampus and inferior frontal gyrus** (positive correlation)
Chiang, 2018	12 PDD, 13 PD-MCI, 16 PD-NC, 29 HC	OFF	II	PD-MCI showed increased FC between MTL-MOL*** (positive correlation)
Bezdicek, 2019	16 PD MCI, 18 PD-NC, 31 HC	ON	II	PD-MCI showed decreased FC between the anterior hippocampi and precuneus/superior parietal cortex** (positive correlation)
Gargouri, 2019	20 PD-MCI, 32 PD-NC, 25 HC	ON	I	PD showed decreased FC between Ch1-2 of the basal forebrain and bilateral hippocampi and parahippocampal gyri, left middle and superior temporal gyri, and left fusiform gyrus** (positive correlation)
Jia, 2019	27 PD-MCI, 27 PD-NC, 25 HCI	OFF	II	PD-MCI showed decreased FC between precuneus and right caudate/putamen*, ** (positive correlation)
Zarifkar, 2021	18 PD-MCI, 9 PDD, 23 PD, 19 HC	ON	II	PD-MCI showed decreased FC between LHC-RHC and between medial prefrontal cortex-PCC*, ** (positive correlation)
Wang, 2021	20 PD-MCI, 13 PD-NC, 13 HC	ON	I	PD-MCI showed decreased FC within bilateral precuneus** (positive correlation)
Pan, 2022	25 PD-MCI, 13 PD-NC, 17 HC	Drug-naïve	II	PD-MCI showed increased right dAI FC with right MCC and PCG** (negative correlation)

Table 5: 8 seed-based studies on memory function

ATTENTION AND WORKING MEMORY

AUTHOR, YEAR	SUBJECTS	LEDD	MDS LEVEL	MAIN FINDING
Hou, 2016	14 PD-MCI, 18 PD-NC, 22 HC	Drug-naïve	II	PD-MCI showed decreased FC between anterior temporal lobe and middle temporal gyrus*, ** (positive correlation)
Chiang, 2018	12 PDD, 13 PD-MCI, 16 PD-NC, 29 HC	OFF	II	PD-MCI showed increased FC between MTL-MOL*** (positive correlation)
Bezdicek, 2019	16 PD MCI, 18 PD-NC, 31 HC	ON	II	PD-MCI showed decreased FC between the anterior hippocampi and precuneus/superior parietal cortex** (positive correlation)
Gargouri, 2019	20 PD-MCI, 32 PD-NC, 25 HC	ON	I	PD showed decreased FC between Ch1-2 of the basal forebrain and bilateral hippocampi and parahippocampal gyri, left middle and superior temporal gyri, and left fusiform gyrus** (positive correlation)
Zarifkar, 2021	18 PD-MCI, 9 PDD, 23 PD, 19 HC	ON	II	PD-MCI showed decreased FC between LHC-RHC*, ** (positive correlation)
Pan, 2022	25 PD-MCI, 13 PD-NC, 17 HC	Drug-naïve	II	PD-MCI showed increased right dAI FC with right MCC and PCG** (negative correlation)

Table 6: 6 seed-based studies on attention and working memory function.

CONCLUSION

Compensatory mechanisms and network reorganisation in cognitively impaired PD patients are widely described in the present literature. The reviewed studies highlight that early functional disruption occurs in PD prior to clinical evidence of dementia. With minimised constraints for PD patients with dementia, resting state fMRI can play an important role in exploring the progression of cognitive decline in PD from subtle cognitive impairment to dementia.

The findings of this study will potentially contribute to the identification of potential diagnostic markers and targeted treatments for each cognitive domain impairment in PD.

References:

1. Litvan I, Goldman JG, Troster AI, Schmand BA, Weintraub D, Petersen RC, et al. Diagnostic criteria for mild cognitive impairment in Parkinson's disease: Movement Disorder Society Task Force guidelines. Mov Disord. 2012;27(3):349-5

Exploring Recycling Opportunities to Reduce the Negative Impact of Pharmaceutical Waste in RBWH Pharmacy Department

Dr. Judith Singleton[1,2] , Mr. Brett Sweeney[3], Mr. Alexander Letts[1,2]

[1]Queensland University of Technology, [2]EARTH Research Group, QUT Resilience Centre; [3]Metro North Health, RBWH Pharmacy Department

Rationale

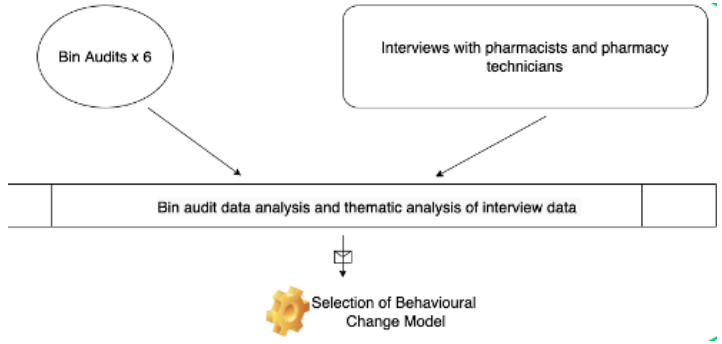
- Identify components of pharmaceutical waste currently disposed of in the clinical waste stream,
- Explore staff's beliefs and attitudes towards reuse/recycling where possible, and,
- Develop a recycling behaviour change intervention to reduce amount of pharmaceutical waste being disposed of.

Methods

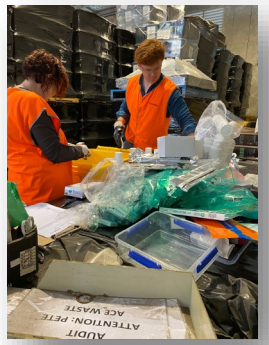
- Mixed Methods

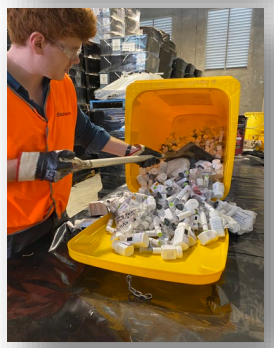
Interview Participants (n=26)
- Pharmacists
- Pharmacy technicians

Bin Audits (n=6)
- Validated audit protocol developed by JS



Theoretical Framework: Integrated Behaviour Change Wheel + Theoretical Domains Framework – interview data manually coded to framework ⇢ behaviour change intervention





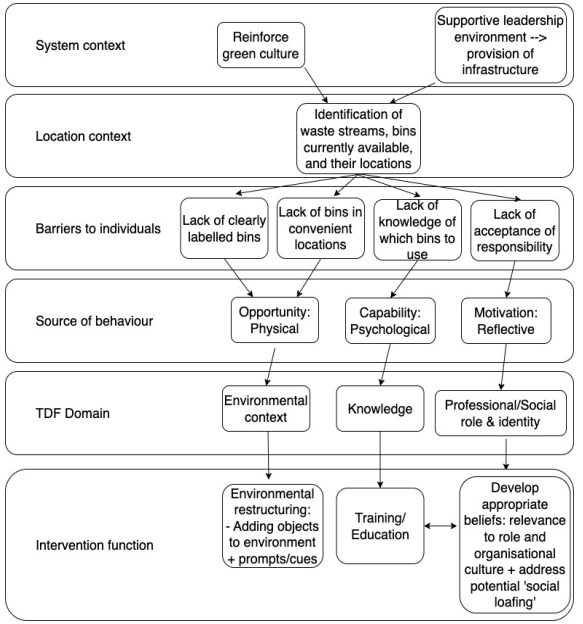
Results

A. Bin Audit Results

- Total weight of contents of 6 bins = 139.4 kg
- Weight recyclable packaging waste = 41kg (0.036tCO_2e if incinerated)
- Recyclable packaging waste as % of bin contents = 29.1%

2 bins audited for unexpired, potentially recyclable drugs
- 13.9 kg (0.012tCO_2e if incinerated)
- 24.9% of bin contents

B. Semi-structured Interviews



Conclusions

- Scope 1 emissions from incineration of recyclable drugs + recyclable packaging waste
  = 0.048tCO_2e (equates to approx. 327km of car travel)
- Increasing recycling has financial and environmental benefits for RBWH
- Clinical trials contribute significantly to volume of waste incinerated

Cost-Effectiveness and Value of Information Analysis of Hand Therapist-Led, Technology-Enhanced Group-Based Rehabilitation after Carpal Tunnel Release Surgery

Dr Mohammadreza Amiri[1], Mrs Emma Taylor[2], Dr Emmah Doig[3], Professor Trevor Russell[4], Dr Emma Ballard[5], Mrs Tamsin Mahoney[2], Semele Robinson (consumer), Dr Ridzwan Namazie[2], Professor Nadine E Foster[3], Mrs Caroline Wegrzyn[2], Professor Haitham Tuffaha[1]
[1]Centre for the Business and Economics of Health, The University of Queensland, QLD, Australia; [2]Surgical Treatment and Rehabilitation Service (STARS), Herston, QLD, Australia; [3]STARS Education and Research Alliance, Herston, QLD, Australia; [4]RECOVER Injury Research Centre, The University of Queensland, QLD, Australia; [5]QIMR Berghofer Medical Research Institute, Herston, QLD, Australia

BACKGROUND & AIMS

- Hand therapist-led, technology-enhanced group-based (TEG) rehabilitation after carpal tunnel surgery shows potential benefits.
- **Feasibility and pilot randomised controlled trial (RCT):** Initial trial results.
- **Cost-effectiveness analysis (CEA):** Compare TEG vs. usual care.
- **Value of information analysis (VOI):** Value of a future multicentre RCT.

Table 1. Model input parameters

PARAMETER	VALUE	SOURCE
Willingness-to-pay for a QALY	$50,000	Assumed
Fixed cost of sampling	$2,500,000	As per a previous grant proposal
Variable cost of sampling	$500	As per a previous grant proposal
Average hourly wage of general population (work productivity loss)	$44	Australian Bureau of Statistics, 2024
Average hourly wage of clerical and administrative workers	$39	Australian Bureau of Statistics, 2024
Clerical and administrative time required	5 min.	Assumed
Average transportation cost for TEG group	$17	Calculated from trial data
Health Practitioner [1]		Queensland Health, 2024
Level 4.2	$66	
Level 5.2	$76	
Level 6.2	$84	
Incidence rate of CTS	276 per 100,000	Genova et al., 2020
Proportion of CTS patients requiring surgery	27.40%	Burton et al., 2018
Annual application licensing fee	$150[2]	Physitrack® (PhysiApp)
Population of Australia in 2024	26,966,789	Australian Bureau of Statistics, 2024
Beneficiary population in 10 years	150,000	Population of Australia × Incidence rate of CTS × Proportion of CTS patients requiring surgery discounted for 10 years

CTS, carpel tunnel syndrome; QALY, quality-adjusted life years.
[1] assumed to be similar to the health practitioner cost for Australia; [2] per license fee; in the model, this fee was considered $8.8 per individual ($150/17 participants).

METHODS

Study Design

- CEA using individual patient data from rehabilitation sessions.
- Parameters are summarised in Table 1.
- Societal perspective for cost and utility calculations.

Data

- **Costs:** Included direct healthcare (health practitioner wages, rehabilitation time, application licensing, administrative costs), transportation costs, and opportunity costs (work time loss).
- All costs were in 2024 AUD.
- **Health utilities:** Derived from EQ-5D-5L data at baseline and 6-week follow-up.

Analyses

- **CEA:** Explored using incremental net monetary benefit.
- **VOI analysis:** Included expected value of perfect information (EVPI) to quantify decision uncertainty and assess future multicentre RCT.

RESULTS

CEA

- TEG group was cost-saving compared to usual care (Table 2).

Table 2. Cost-effectiveness analysis results

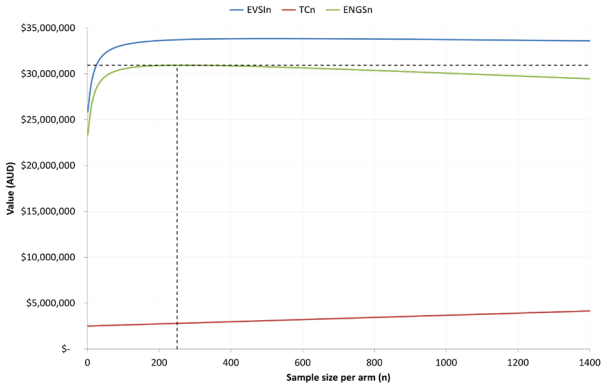
	TEG	Routine Care	INCREMENT
Sample size (n)	17	15	-
Mean QALYs (SE)	0.0898 (0.0045)	0.0941 (0.0041)	-0.0043 (0.0044)
Mean Cost (SE)	$75 ($3)	$117 ($19)	-$42 ($13)
Mean NMB (SE)	$4,418 ($227)	$4,590 ($213)	-$172 ($220)

NMB, Net Monetary Benefit; QALY, quality-adjusted life year; SE, standard error; TEG, technology-enhanced group-based rehabilitation group.

VOI Analysis

- EVPI: $34.3 million for beneficiary population of 150,000 over 10 years.
- Expected Value of Sample Information (EVSI) increases rapidly for small sample sizes, plateaus around 250 participants per arm (Figure 1), with a maximum approximately $33.8 million.
- Expected Net Gain of Sampling (ENGS) peaks at around 250 participants per arm (optimal sample size), with a maximum of approximately $6 million.
- Conducting further research on TEG in Australia is worthwhile to reduce uncertainty.

Figure 1. Expected value of sample information and expected net gain of sampling



EVSI, expected value of sampling information; ENGS, expected net gain of sampling; TCn, total cost per sample size.

CONCLUSION

- TEG is cost-saving compared to usual care.
- VOI analysis supports conducting additional research.
- Proposed minimum sample size for a future multicentre RCT is 250 per arm.
- Further research could lead to more precise estimates and improved decision-making.

REFERENCES

Australian Bureau of Statistics. (2024). National, state and territory population.
Briggs (2012). Statistical methods for cost-effectiveness analysis alongside clinical trials.
Norman et al. (2023). Pharmacoeconomics, 41(4), 427-438.
Ramsey et al. (2015). Value in Health, 18(2), 161-172.
Queensland Health. (2024). Health Practitioner Wage Rate.
Wilson (2015). Pharmacoeconomics, 33(2), 105-121.

Genome-Wide Methylation Profiling of Circulating Extracellular Vesicles from Patients with Gestational Diabetes Mellitus

Reshinthine Purushothaman[1], Nanthini Jayabalan[1], Soumyalekshmi Nair[1,2], Andrew Lai[1,2], Katherin Scholz-Romero[1,2], Melissa Razo-Azamar[1,2], Martha Lappas[3], Dominic Guanzon[1,2], Carlos Salomon*[1,2].

[1]Translational Extracellular Vesicles in Obstetrics and Gynae-Oncology Group, University of Queensland Centre for Clinical Research, Faculty of Medicine, The University of Queensland, Brisbane QLD 4029, Australia.

[2]UQ Centre for Extracellular Vesicle Nanomedicine, The University of Queensland, Brisbane QLD 4029, Australia.

[3]Obstetrics, Nutrition and Endocrinology Group, Department of Obstetrics and Gynaecology, University of Melbourne, Victoria, Australia.

1. INTRODUCTION

Gestational Diabetes Mellitus (GDM) distinct from of diabetes that arises during pregnancy

Delayed diagnosis + lack of risk prediction → adverse maternal and fetal outcomes

Blood-based liquid biopsies are an attractive method for predicting GDM risk and disease progression. Circulating Extracellular Vesicles (EVs) present in blood are lipid nanoparticles that carry bioactive molecules like nucleic acids that mediate cell-to-cell communication during pregnancy. While cell-free DNA is an emerging tool for liquid biopsies, EV-derived nucleic acids such as EV DNA are understudied in GDM diagnostics. This discovery study aims to uncover the differences between CF and EV DNA epigenetics (specifically DNA methylation) and understand the utility of EV DNA for disease monitoring for early diagnosis of GDM.

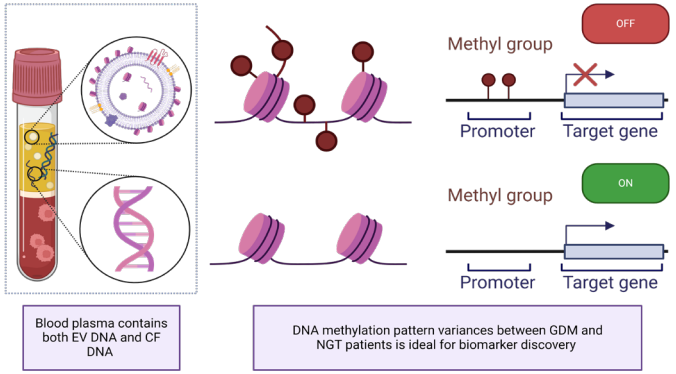


Figure 1. EVs and CF DNA pool in the circulating blood, making them an ideal target for blood-based diagnostics like liquid biopsies.

2. METHODS

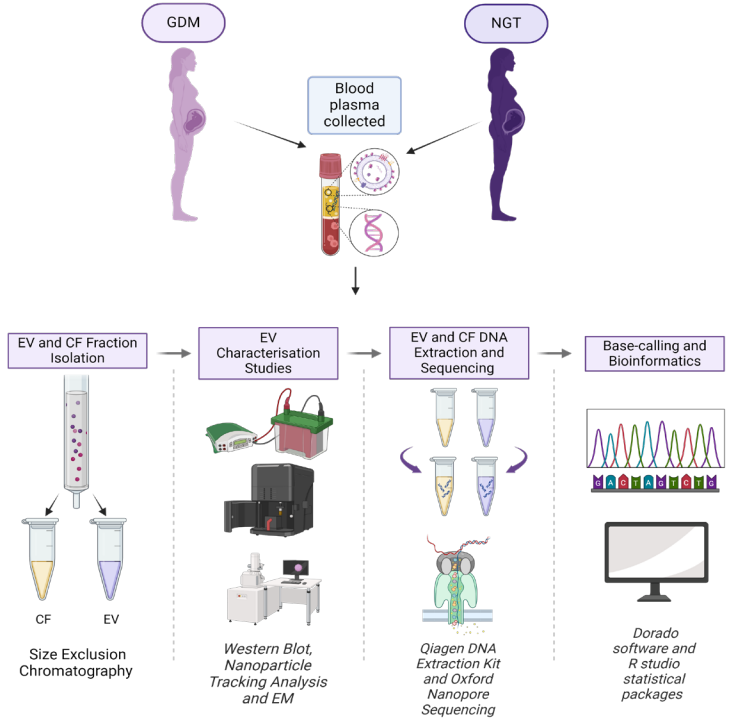


Figure 2. Schematic workflow for comparing CF DNA and EV DNA for biomarker discovery in GDM. Plasma was obtained from women with GDM (n = 30) and Normal Glucose Tolerance (NGT) (n=30). The extracellular and cell-free components from plasma were isolated using size-exclusion chromatography and characterized. The DNA was extracted using Qiagen DNA extraction kit and Qubit assays. Long-read Oxford Nanopore sequencing was used to comprehensively characterize and compare extracellular vesicle DNA with cell-free DNA. Sequencing was performed over 96 hours, and the resulting raw data base-called using Dorado software.

3. RESULTS

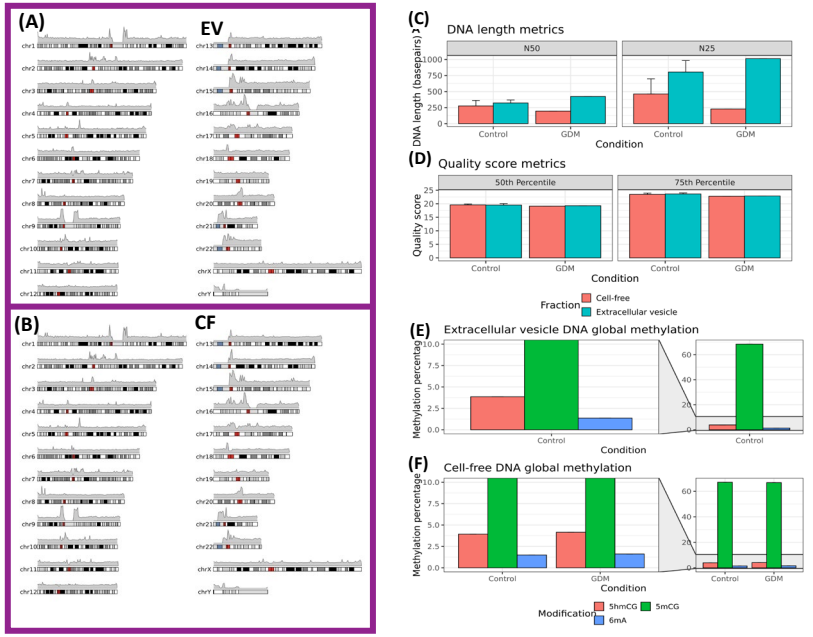


Figure 3. Extracellular vesicles have longer DNA compared to cell-free DNA components in human control and GDM plasma (C). In addition, both cell-free DNA and extracellular vesicle DNA show consistent quality scores between control and GDM (D). The genome coverage of cell-free DNA and EV DNA is similar (A, B). Analysis of global methylation patterns reveals elevated levels of 5mCG and decreased levels of 5hmCG and 6mA methylation, regardless of DNA component (E, F).

4. CONCLUSIONS

- ✓ Both EV and CF DNA show consistent quality, genome coverage and unchanged global methylation levels
- ✓ EV DNA is longer, aiding long-read genomic analysis
- ✓ Both types of DNA can be used for comprehensive genomic and epigenomic analysis in GDM to offer insights into disease progression.

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

Is a publicly funded, allied health-led, obesity service effective for improving access to surgery?

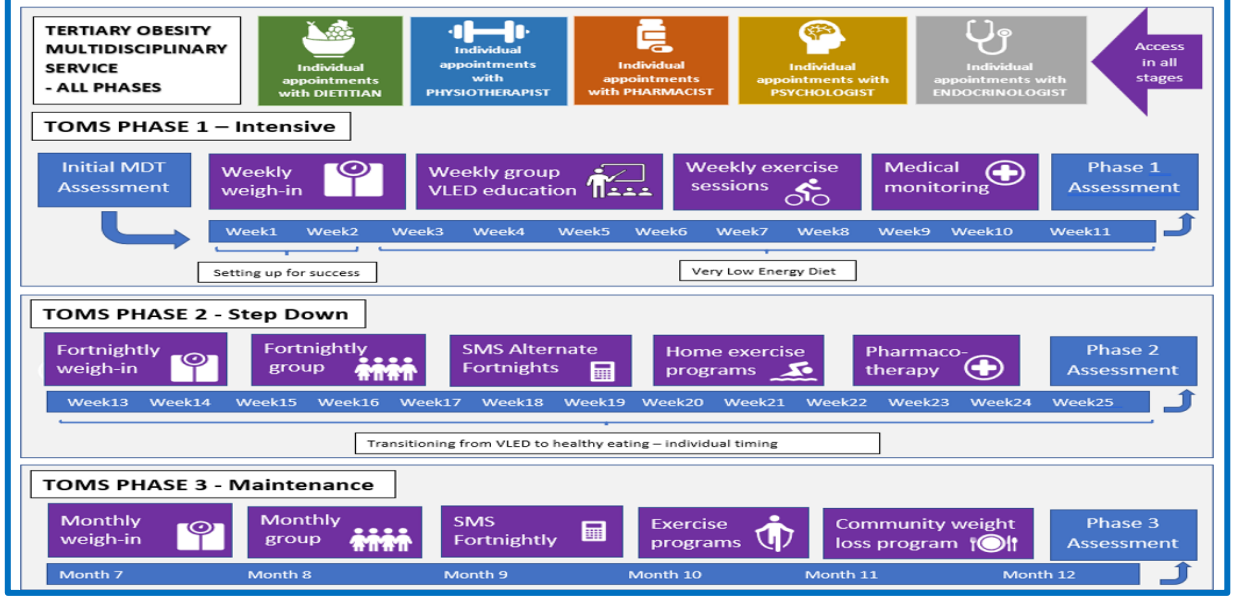
Andrea Cawte[1], Robin Hay[1], Scott Ruddell[1], Gemma Woodruff[1], Elizabeth Ryan[1], Dr Matthew Seymour[1], Keren Singh[1], Dr Helen MacLaughlin[1,2] 1. Tertiary Obesity Multidisciplinary Service, Royal Brisbane and Women's Hospital, QLD; 2. Queensland University of Technology, Exercise & Nutrition Science, QLD

INTRODUCTION

The Tertiary Obesity Multidisciplinary Service (TOMS) is an innovative 12-month interdisciplinary allied-health led program. TOMS is available to all medical and surgical specialties at Royal Brisbane & Women's Hospital to improve health outcomes beyond weight loss, enable access to healthcare services, including surgery, and provide efficiencies of care. This study aimed to evaluate the TOMS model of care that included improving access to surgery for candidates deemed ineligible due to their weight.

METHODS

An observational cohort study was conducted with participants attending the multidisciplinary TOMS program in three phases; weekly VLED support and exercise for 12 weeks (phase 1), fortnightly support for 14 weeks during transition to healthy lifestyle (phase 2) and monthly maintenance for 26 weeks (phase 3). Pre-program and post-phase multidisciplinary assessments were completed, including evaluation of clinical outcomes, attendance and access to surgery.



WHAT IS A VLED?

A very low energy diet (VLED) replaces three meals with a nutritionally complete product plus two cups of non-starchy vegetables, one teaspoon of oil and at least two litres of fluid daily – approx. 3200kJ/day, to facilitate rapid weight loss.

RESULTS

103 patients commenced TOMS between January 2021 – January 2023. TOMS program is effective for losing weight and sustaining weight loss.

Anthropometry measure Mean loss [SD]	Weight loss during each phase			
	Initial –> phase 1	Phase 1 –> phase 2	Phase 2 –> phase 3	Initial –> phase 3
Weight	-13.4kg [7.3] *p < 0.001*	-2.5kg [6.6] *p = 0.004*	+4.0kg [8.7] *p = 0.01*	-12.8kg [18.4] *p < 0.001*
Waist	-10.5cm [4.8] *p < 0.001*	-4.0cm [5.7] *p < 0.001*	+4.1cm [4.8] *p = 0.004*	-11.4 [11.5] *p < 0.001*

Characteristics at commencement of TOMS	Value
Female	63/103
Age (mean)	49.4 yrs
Weight (mean) (85-261.6kg)	142.3kg
BMI (mean) (30.5-80.7kg/m2)	48.6kg/m2
Waist (mean) (94-187cm)	134.7cm

Access to surgery:

- 50/103 (48.5%) TOMS patients referred by surgical teams
- 45/50 (90%) surgical patients completed phase 1
- 29/50 (58%) patients have had surgery
- 2/50 (4%) are waitlisted
- 3/50 (6%) no longer require surgery

Therefore:

- 34/50 (68%) patients who completed phase 1 TOMS to access surgery have been treated due to outcomes achieved in TOMS

Reasons for surgery	Number referred	Surgery completed	% completed
• Bariatric surgery	16	8	50
• Fundoplication	1		
• Hernia repair	7	4	57
• Breast reconstruction / plastics	1	1	
• Gynaecology (hysterectomy, oophorectomy, cyst removal, oncology)	7	7	100
• Urology (prostate, pyeloplasty, sling)	9	6	67
• Colorectal (reversal of stoma)	3	1	33
• Heart-lung transplant listing	1		
• Cardiac ablation	1	1	100
• Neurosurgery	1		
• Orthopaedics (knee, hip)	2	1	50
• Thyroid	1		
• TOTAL	50	29/50	64%

CONCLUSION

This publicly funded, allied health-led, obesity treatment service was effective in achieving pre-surgery weight loss targets, facilitating surgery, and long-term weight-loss maintenance.

Mobilisation after pelvic exenteration surgery: a retrospective audit

Stella Foley, Peter Window, **Peter Thomas**. Department of Physiotherapy, Royal Brisbane and Women's Hospital.

Background: Pelvic exenteration is a complex and extensive surgery performed for locally advanced or recurrent rectal cancer but is potentially curative. The level of resection performed varies but can include removal of all organs from the pelvic cavity; resection of pelvic tissues including the sacrum, ilium and ischium, muscles and nerves. It may also involve reconstructive surgery with flaps used when extensive perineal resection is required. Recovery after pelvic exenteration surgery can be prolonged. The aim of this study was to examine which surgical factors may impact on the functional recovery of patients post pelvic exenteration.

Methods: A retrospective chart audit was completed on patients undergoing pelvic exenteration surgery over a 7-year period (2015-2021). Demographic and surgical information was collected, and functional milestones were recorded up until discharge from hospital or death. Results were analysed based on three compounding levels of surgery (pelvic exenteration alone (PEx); pelvic exenteration including abdominoperineal resection (PEx+APR); and pelvic exenteration including abdominoperineal resection and flap reconstruction (PEx+APR+Flap).

Results: 104 patients were included the in the analysis (n = 56 (54%) male; age 57 (46-64) years). The number of patients grouped by the level of surgery was 31 (30%) undergoing PEx alone; 43 (41%) with PEx+APR; and 30 (29%) with PEx+APR+Flap. Bony excision occurred in 53 (51%) of patients and nerve resection in 29 (28%).

Prior to surgery, most patients were able to walk independently without an aid (n = 102, 98%).

The level of surgery had a significant impact on functional outcomes during the period of hospital stay.

- Patients with PEx+APR+Flap surgery took a longer time to achieve the first stand (4 (3-7) days) compared to PEx+APR (3 (2-5) days) and PEx alone (2 (2-3) days), p = 0.002).
- Patients with PEx+APR+Flap surgery also had a longer time to achieve the first sit out of bed (15 (12-27 days) compared to PEx+APR (4 (2-7) days) or PEx alone (2 (1-5) days, p < 0.001).

Hospital length of stay was longer for patients with PEx+APR+Flap (37 (30-85) days) and PEx+APR (37 (24-58) days) compared to PEx alone (21 (16-29) day, p < 0.02). Differences in mobility were still reflected at the time of hospital discharge. More patients could walk independently at discharge if they had PEx alone (n = 27, 90%), compared to patients with PEx+APR (n = 26, 60%) or PEx+APR+Flap (n = 15, 48%; p = 0.028). The need for bony excision or nerve resection did not influence functional outcomes achieved.

Patients undergoing PEx+APR+Flap were less frequently discharged home (n = 11 (36%)) compared to patients with PEx+APR (n = 24 (56%)) or PEx alone (n = 21 (70%), p = 0.03). Patients with PEx+APR+Flap surgery were more often transferred to another hospital or acute care facility (n = 11 (36%)) or to an inpatient rehabilitation unit (n = 9 (29%)).

Conclusions: Pelvic exenteration surgery requiring flap reconstruction (PEx+APR+Flap) has the greatest impact on functional outcome at hospital discharge and requirements for ongoing inpatient rehabilitation.

Impact: While pelvic exenteration is potentially curative, it can have a significant impact on a person's functional ability. This study provides valuable information that can be used by staff to better inform people who are being considered for pelvic exenteration surgery regarding the likely functional outcomes achieved during their post-operative hospital stay and possible requirements for rehabilitation.

Acknowledgements: The project was supported by the RBWH Physiotherapy Department with contributions from Caitlain Cawte, Samantha Hagan, Ellie Hawkins, Charlotte Jackson, Charlotte Kiemann, Andrew Kim, Meg Moore, Nanette Paxman, Ashlee Snoswell, Andrew Statham, Nadine Young, Bronte Wilson. **HREC:** This was a quality improvement project (EX/2022/QRBW/84640). **For more information email:** PeterJ.Thomas@health.qld.gov.au