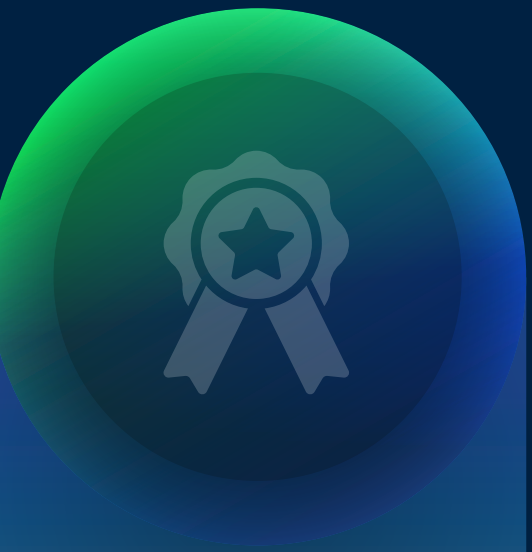
QUALITY INITIATIVES

ACHS International Quality Improvement Awards 2025



ACHS International

ACHS International Quality Improvement Awards

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9th Edition 2006
10th Edition 2007
11th Edition 2008
2th Edition 2009
13th Edition 2010
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18th Edition 2015
19th Edition 2016
20th Edition 2017
21st Edition 2018
22nd Edition 2019
23rd Edition 2020
24th Edition 2021
25th Edition 2022
26th Edition 2023
27th Edition 2024

CONTENTS

Introduction

The ACHS International Quality Improvement Awards 2025

The annual ACHS International Quality Improvement (QI) Awards acknowledge and encourage outstanding quality improvement activities, programs or strategies that have been implemented in healthcare organisations. The QI Awards acknowledge healthcare organisations that achieve excellence and innovation in clinical care, or organisation-wide practice, service delivery, performance measurement and patient-focused innovation.

The ACHS International QI Awards are open to submissions from all ACHS International member organisations.

Judging is conducted by a judging panel for each of the QI Awards categories:

Clinical Excellence and Patient Safety:

This category recognises innovation and demonstrates quality improvement in the delivery of safe, effective patient care.

Sustainable Healthcare and Service Delivery:

This category acknowledges demonstrated outcomes in non-clinical service delivery, improvement and innovation in sustainable healthcare, environmental sustainability, patient / consumer services, and organisation-wide practice. This includes services provided by community and allied health.

Healthcare Measurement:

This category recognises organisations that have measured an aspect of clinical management and/or outcome of care, taken appropriate action in response to that measurement, and demonstrated improved patient care and organisational performance upon further measurement. Healthcare measurement can include data collected from the ACHS Clinical Indicator program or other methods of monitoring patient care processes or outcomes. Both quantitative and qualitative data can be used, however this category must describe the initial measurement, the analysis of that measurement, the action(s) implemented, and the improved measurement(s).

Winner Submissions by Category

The ACHS International Quality Improvement Awards 2025

CLINICAL EXCELLENCE AND PATIENT SAFETY

Hung Vuong Hospital, VIETNAM

Neonatal Department and Neonatal Intensive Care Unit

Improving Preterm Infant Care through Early and Continuous Kangaroo Mother Care in Neonates ≥30 Weeks at Hung Vuong Hospital

Dr. Bui Thi Thuy Tien, Dr. Le Anh Thi, Dr. Do Hoang Yen, MSc., Dr. Mai Cong Danh, Ms. Huynh Thi Hong Hanh, Ms. Nguyen Thi Hong Phuc, Dr. Hoang Thi Diem Tuyet, Dr. Huynh Xuan Nghiem, Dr. Phan Thi Hang, Phr. Huynh Thi Ngoc Hanh, MSc. Vo Thi Ngoc Diep and Dr. Truong Thi Anh Tuyet

Full submission page 6

SUSTAINABLE HEALTHCARE AND SERVICE DELIVERY

Sunway Medical Centre, MALAYSIA

Operations Department

Sustainable Healthcare: Integrating Innovation, Care, and Environmental Responsibility

Mr Leong Ming Chung, Ms Kalliamah Sanjeevi and Ms Nur Shalinie Binti Ridzuan

Full submission page 48

HEALTHCARE MEASUREMENT

Mouwasat Hospital Jubail, SAUDI ARABIA

Quality & Patient Safety Department

Improving Safety, Quality and Efficiency of Care Through the Development of a Patient Reported Outcome Measures (PROMS)

Dr. Samer Abdu, Dr. Heraa Zarea, Mis Mariam Zanati, Dr. Hytham Mousa, Eden Lapizar, Mary Ann Bathan and Mr. Mohamed A. El-Nabarawy

Full submission page 68

Highly Commended Submissions by Category

The ACHS International Quality Improvement Awards 2025

CLINICAL EXCELLENCE AND PATIENT SAFETY

Saudi German Hospital (SGH) Dammam, SAUDI ARABIA

Quality and Patient Safety Department

The Power of HSI: Advancing Patient Safety and Service Excellence Across the SGH Network

Dr. Eman Abu Koush, Dr. Sheren Kamel, Mr. Mumtaz Yousuf, Dr. Mohab Fawzy, Dr. Moustafa Hassoun, Dr. Dalia Abdalla, Dr. Bassant Abdelhady, Eng. Hajer Jrad, Dr. Hala Soliman, Dr. Hala Soliman, Dr. Eman Ragab and Dr. Mohammed Hussein

Dubai Health, UNITED ARAB EMIRATES

Patient Safety and Quality Department

Zero by Design: Data-Driven Catheter-Associated Urinary Tract Infection (CAUTI) Prevention in a Paediatric Hospital at DUBAI HEALTH

Mr. Adli Baroud, Dr. Walid Abuhammour, Ms. Priya Padmanabhan, Dr. Deborah Westwood, Dr. Hesham Abdalla, Ms. Yuser Hamad, Mr. Adel Sharadgah, Ms. Samah Abdel Hamid Faeq Darwazeh, Mr. Jithin Raj Rajendran Pillai, Mr. Amal Vimalan, Dr. Mohammed Amber Khan and Dr. Entesar Abdulla Sultan Ali AlHammadi

SUSTAINABLE HEALTHCARE AND SERVICE DELIVERY

Todua Clinic, GEORGIA

IT Department

Artificial Intelligence for Sustainable and Patient-Centred Service Delivery at Todua Clinic

Mr Irakli Poladashvili, Mr Anri Chkhaidze, Mr Lasha Sharvadze and Ms Sophio Gognadze

HEALTHCARE MEASUREMENT

Hoan My Sai Gon Hospital, VIETNAM

Quality Management Department

Data-Driven Quality Improvement: Establishing a Healthcare Measurement System through Risk Library and Centralised Management to Enhance Patient Safety and Care Quality

Mr. Tran Chau Hoa, Ms. Do Thi Trang and Ms. Bui Ngoc Chau

CLINICAL EXCELLENCE AND PATIENT SAFETY

WINNER

Hung Vuong Hospital, VIETNAM

Neonatal Department and Neonatal Intensive Care Unit

Improving Preterm Infant Care through Early and Continuous Kangaroo Mother Care in Neonates ≥30 Weeks at Hung Vuong Hospital

Dr. Bui Thi Thuy Tien, Dr. Le Anh Thi, Dr. Do Hoang Yen, MSc., Dr. Mai Cong Danh, Ms. Huynh Thi Hong Hanh, Ms. Nguyen Thi Hong Phuc, Dr. Hoang Thi Diem Tuyet, Dr. Huynh Xuan Nghiem, Dr. Phan Thi Hang, Phr. Huynh Thi Ngoc Hanh, MSc. Vo Thi Ngoc Diep and Dr. Truong Thi Anh Tuyet

AIM

To evaluate the effectiveness of the early and continuous Kangaroo Mother Care model in preterm infants from 30 to 33+6/7 weeks' gestational age at Hung Vuong Hospital, focusing on length of hospital stay, exclusive breastfeeding rate, respiratory complications, and infections.

SUMMARY ABSTRACT

Background:
Kangaroo Mother Care (KMC) early initiation is an effective care strategy for preterm infants, recommended by the World Health Organisation (WHO) to be applied immediately after birth. However, domestic data on the effectiveness of early and continuous KMC at front-line hospitals remain limited.

Method:
Hung Vuong conducted a comparative cohort study including an intervention group (early and continuous KMC - prospective) and a control group (retrospective). The sample size included 38 infants in the 32-<34 weeks group and 81 infants in the 30-<34 weeks group in each arm. Statistical analysis was performed using univariate and multivariate linear regression. The primary outcome was median length of hospital stay. Secondary outcomes included exclusive breastfeeding rate and complication rates during hospitalisation.

Results:
Median length of stay:

- Infants 32-33+6/7 weeks: 7 days in the KMC group vs. 11 days in the control group ($p < 0.001$).
- Infants 30-33+6/7 weeks: 8 days in the KMC group vs. 21 days in the control group ($p < 0.001$).
- Multivariate regression showed that KMC reduced the average hospital stay by 8.06 days (95% CI: -6.28 to -9.84; $p < 0.001$) in the 30-<34 weeks group.
- The exclusive breastfeeding rate in the KMC group reached 91.2%, significantly higher than the control group (74%) among infants 32-<34 weeks.

No statistically significant difference was found in infection or mortality rates, though there was a trend toward reduction in the early and continuous KMC group.

REPORT

APPLICATION OF ACHS INTERNATIONAL (ACHSI) PRINCIPLES

1. Consumer Focus
Mothers and families are placed at the center of the neonatal care process, considered not merely as service recipients but as partners in treatment. This approach enhances care effectiveness, shortens hospital stay, and improves family satisfaction.

2. Effective Leadership
The Board of Directors and leadership of Neonatology, Obstetrics, and Anaesthesiology departments collectively prioritised early KMC as a standard care strategy for preterm infants. They provided support in human resources, space, and equipment to implement continuous KMC from the delivery room, operating theatre, postoperative ward, to the Neonatal Intensive Care Unit (NICU). Effective leadership in the early KMC project at Hung Vuong Hospital was demonstrated through strong commitment, mobilisation of a multidisciplinary team, flexible implementation, and guiding practice changes toward patient-centred care.

3. Continuous Improvement
Ongoing evaluation, feedback, process adjustment, and action were implemented to continuously improve the quality of preterm neonatal care. Goals include progressively increasing the rate of early KMC and lowering the gestational age threshold for early and continuous KMC initiation.

4. Evidence of Outcomes
Research results demonstrated that early and continuous KMC is not only safe but also significantly effective in clinical practice, reducing hospital stay, increasing breastfeeding rates, and improving respiratory health outcomes in preterm infants. This provides a solid foundation to encourage adoption of the model at other healthcare facilities nationwide.

5. Striving for Best Practice
The implementation of early and continuous KMC at Hung Vuong Hospital is not simply a clinical trial but a process reflecting strong commitment to continuously enhancing neonatal care quality, especially for preterm and low-birthweight infants. The healthcare team proactively accessed international evidence while flexibly adapting it to local conditions. The goal is to achieve a 100% exclusive breastfeeding rate among infants receiving early and continuous KMC.

INNOVATION IN PRACTICE AND PROCESS

In recent years, the application of Kangaroo Mother Care (KMC) has advanced beyond the traditional model, which was only initiated once the infant was stable, toward an innovative approach of "early and continuous KMC", especially for preterm infants. This marks an important step in modern neonatal care, involving multidisciplinary collaboration and adjustments to care processes from the delivery room and operating theatre to the postoperative ward and neonatal unit.

At Hung Vuong Hospital, classical KMC has been implemented since 2009, starting with 3 Kangaroo beds, which increased to 14 beds by 2015 and 48 beds in 2023. Accordingly, the number of infants receiving KMC rose from 250 to 955 annually. In 2023, KMC was also extended to infants born at 34–37 weeks in the postpartum and post-surgical wards, achieving a rate of over 90%, contributing to improved quality of life. In the Neonatal Department, KMC was performed for 80% of all preterm infants.

Previously, infants ≤34 weeks were admitted directly to the NICU and separated from their mothers. These infants were deprived of immediate access to breast milk and remained in intensive care for several days. Additionally, NICU admission increased the risks of hypothermia and cross-infection. The implementation of this program reduced the burden on NICU services, which faced limited staffing and resources.

Since 2024, early and continuous KMC has been established as the standard model of care for preterm infants between 30–33+6/7 weeks. Early KMC is defined as initiation within 2 hours after birth, while continuous KMC

involves uninterrupted skin-to-skin contact lasting over 24 hours, maintained from the delivery room and operating theatre to the neonatal or postoperative wards. The early KMC group was followed prospectively and compared to a retrospective control group without KMC during the same period.

To successfully implement this model, Hung Vuong Hospital introduced multiple innovations in workforce organisation, equipment, and clinical processes. Neonatologists worked closely with obstetricians to evaluate the feasibility of early KMC immediately after birth. Supportive equipment such as CPAP systems in the delivery room, T-piece resuscitators with oxygen, skin-to-skin contact protocols, and warming plastic sheets were prepared in advance. A standardized intrahospital transfer pathway from delivery to postoperative or neonatal units was established, ensuring uninterrupted skin-to-skin contact.

Results demonstrated:

- Median length of stay:
  - Infants 32–33+6/7 weeks: 7 days in the KMC group vs. 11 days in the control group ($p < 0.001$).
  - Infants 30–33+6/7 weeks: 8 days in the KMC group vs. 21 days in the control group ($p < 0.001$).
  - Multivariate regression showed that KMC reduced the average hospital stay by 8.06 days (95% CI: -6.28 to -9.84; $p < 0.001$) in the 30–<34 weeks group.
- Exclusive breastfeeding rate: 91.2% in the Kangaroo group, significantly higher than 74% in the non-Kangaroo group (32–<34 weeks).
- No statistically significant difference was observed in infection or mortality rates, but there was a decreasing trend in the early and continuous Kangaroo group.

This model not only provided clinical benefits but also reduced treatment costs, enhanced mother–infant bonding through immediate skin-to-skin and early breastfeeding, reduced risks of infant misidentification and hospital-acquired infections and supported long-term neurodevelopment.

In summary, the implementation of early and continuous KMC represents a major innovation in the care of preterm infants. Scaling up this model in other eligible facilities is both feasible and strongly encouraged.

APPLICABILITY TO OTHER SETTINGS

The implementation of early and continuous KMC at Hung Vuong Hospital demonstrated not only clear clinical effectiveness but also high feasibility in real-world conditions. With positive outcomes such as reduced average hospital stay and increased exclusive breastfeeding rates up to 92.1%, the model establishes a foundation for replication in other hospitals, including provincial and district-level facilities.

A key strength of this model is that it does not require advanced technology or high-cost equipment. Early KMC at Hung Vuong relied mainly on close coordination among departments—delivery room, operating theatre, postoperative ward, and neonatal unit. Supportive tools such as CPAP, T-piece resuscitation devices, oxygen systems, warming plastic sheets, and mother–infant skin-to-skin transport are already available in most maternity–paediatric facilities. This demonstrates the feasibility of applying the model at lower-level hospitals, provided adequate preparation in processes and staffing is in place.

Importantly, the model emphasises the human factor: the proactive role of neonatologists and midwives in assessing eligibility for early KMC, counselling families, and ensuring uninterrupted skin-to-skin contact from birth. These skills and professional attitudes are entirely trainable and transferable. Standardizing protocols—from assessment and screening to monitoring during and after KMC—facilitates adoption by other institutions.

From a cost perspective, early KMC is resource-saving (through shorter hospital stays and reduced need for respiratory support) while also alleviating the workload of NICU units. In many provincial hospitals where NICU beds and specialised staff are limited, early KMC offers a rational and effective solution. Both international and domestic evidence supports the sustainable long-term benefits of this model for infant development.

From these perspectives, early and continuous KMC is clearly a scalable model. To ensure successful implementation in other facilities, strong commitment from hospital leadership, continuous staff training, and adaptation of processes to local conditions are essential. The adoption of this model not only enhances treatment

outcomes but also reflects a human-centred philosophy of care— "family-centred care"—aimed at building a safer, more effective, and more compassionate healthcare system.

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CLINICAL EXCELLENCE AND PATIENT SAFETY

HIGHLY COMMENDED

Saudi German Hospital (SGH) Dammam, SAUDI ARABIA

Quality and Patient Safety Department

The Power of HSI: Advancing Patient Safety and Service Excellence Across the SGH Network

Dr. Eman Abu Koush, Dr. Sheren Kamel, Mr. Mumtaz Yousuf, Dr. Mohab Fawzy, Dr. Moustafa Hassoun, Dr. Dalia Abdalla, Dr. Bassant Abdelhady, Eng. Hajer Jrad, Dr. Hala Soliman, Dr. Hala Soliman, Dr. Eman Ragab and Dr. Mohammed Hussein

AIM

This project aims to implement the Hospital Safety Index (HSI) at Saudi German Health (SGH) as a structured framework for evaluating and strengthening hospital safety across 26 defined domains. As a pioneer hospital group to establish such a tool, SGH seeks to pioneer its use in promoting a proactive culture of safety and prevention within the region. By systematically measuring compliance in areas such as medication safety, infection prevention, procedural safety, and facility management, the project aims to identify gaps and prioritise corrective actions.

SUMMARY ABSTRACT

Background:
The Hospital Safety Index (HSI) is a globally recognized assessment and improvement tool designed to evaluate a hospital's ability to remain safe, functional, and resilient during emergencies and disasters. Beyond serving as a checklist, it offers a comprehensive framework for identifying vulnerabilities, measuring compliance with critical safety standards, and recommending targeted, cost-effective interventions that yield high impact (Organisation, 2019; WHO and PAHO, 2015). At Saudi German Hospital (SGH), the HSI was tailored and implemented as a catalyst for continuous improvement, accountability, and trust, enabling systematic measurement, monitoring, and analysis of compliance with essential patient safety standards. Through this structured approach, SGH has positioned itself as a safer institution for patients, staff, and the wider community, strengthening resilience, enhancing preparedness, and reinforcing its commitment to delivering high-quality, reliable care in all circumstances.

Method:
Study Design: This study was conducted as a prospective, longitudinal cohort HSI as the principal framework for evaluating hospital safety and performance.

Setting:
The project evaluated data from all eight Saudi German Hospital (SGH) branches in Saudi Arabia: Makkah, Dammam, Aseer, Hail, Madinah, Hai Al-Jamaa, Riyadh, and Jeddah.

Framework Adaptation and Standards Selection: HSI was tailored for implementation within the SGH network to ensure contextual relevance to national requirements, international benchmarks, and local institutional priorities. The adaptation process followed a rigorous evidence-based approach. Standards were selected from: national frameworks, including the MOH patient safety goals and CBAHI standards; international frameworks, such as JCI, 7th and 8th edition, WHO patient safety initiatives, the Agency for Healthcare Research and Quality (AHRQ), and Occupational Safety and Health Administration (OSHA) requirements; and hospital-level priorities, including sentinel events, reported incident trends, high-risk procedures, and recurrent adverse events within SGH branches.

Through this structured process, the SGH-HSI incorporated 29 domains spanning high-priority safety and quality areas. These included venous thromboembolism (VTE) prophylaxis, patient identification, credentialing and clinical privileges, infection prevention and control, medication safety, emergency preparedness, radiation protection, sedation safety, cardiopulmonary resuscitation (CPR), clinical handover, medical consultation, antibiotic stewardship, surgical safety, pressure ulcer prevention, fall precautions, blood transfusion safety, and communication of critical results and orders. This adaptation ensured that the HSI functioned as a locally relevant, evidence-based tool while maintaining alignment with international best practices.

Domains and Classification:
The 29 domains of HSI were organised into seven broader safety classes to ensure structured assessment and monitoring. Procedural and perioperative safety included anaesthesia, sedation, surgical safety, blood transfusion safety, and radiation safety. Medication safety encompassed high-alert medications, look-alike sound-alike (LASA) medications, concentrated electrolytes, narcotic safety, medication reconciliation, and antibiotic stewardship. Emergency and critical response addressed organisational preparedness through domains such as rapid response team (RRT) activation, cardiopulmonary resuscitation (CPR), restraint safe practice, and infant/child abduction prevention. Clinical governance and professional practice incorporated domains related to clinical privileges, credentialing, and medical consultation. Patient care and clinical processes focused on frontline safety practices, including patient identification, clinical handover, reporting of critical results, fall precautions, pressure ulcer prevention, and venous thromboembolism (VTE) prophylaxis. Infection prevention and control targeted essential practices such as hand hygiene and isolation precautions, while facility and environmental safety emphasised structural and system reliability through fire safety, medical gas safety, and clinical alarms safety.

Data Collection:
Data was collected prospectively from January 2023 through the time of analysis using a standardised HIS Data Collection Sheet. Within each domain, a minimum of 20 cases per branch were reviewed monthly, providing representative coverage of large patient volumes and enabling continuous daily monitoring of safety practices. Multiple data sources were utilised, including structured medical record reviews, direct clinical observations, staff interviews, and key performance indicator (KPI) monitoring.

Scoring and Calculation Method:
The Hospital Safety Index applied a weighted 30/70 scoring approach, allocating 30% to one structural standard that represents the structure or monitoring procedure, and 70% to direct clinical and patient safety outcomes/standards. Under each domain, the structure/ monitoring standard was assessed dichotomously (Met = 2; Not Met = 0), while other standards under the same domain were assessed on a 3-point scale (Met = 2; Partially Met = 1; Not Met = 0), with corrective action initiated immediately for unmet items. Aggregated scores were expressed as percentages at departmental and hospital levels, enabling benchmarking of compliance and performance across all SGH branches.

Data Analysis:
All statistical analyses were performed using IBM SPSS Statistics, version 26. Normality was tested with the Kolmogorov–Smirnov and Shapiro–Wilk tests, both of which confirmed that compliance data were not normally distributed. Therefore, non-parametric methods were applied. The Friedman test was used to assess changes in compliance across time points within each branch and class. Where significant differences were observed, Wilcoxon signed-rank tests with Bonferroni correction were conducted for post-hoc pairwise comparisons.

Results:
Implementation of the Hospital Safety Index at Saudi German Hospital resulted in measurable improvements across several critical domains with a direct impact on patient safety and quality of care. Significant advancements were achieved in Infection Prevention and Control (82% to 93%), Procedural and Perioperative Safety (85% to 95%), and Patient Care and Clinical Processes (84% to 88%), with significant improvement in Venous Thromboembolism (VTE) assessment, Clinical Privileging, and Credentialing domains, strengthening the framework of clinical governance. The most remarkable progress was observed in Facility and Environmental Safety, which increased from 80% to 97%. Collectively, these outcomes highlight the effectiveness of HSI implementation in enhancing hospital safety systems, reducing clinical risk, and improving overall patient

outcomes. The impact of these improvements reflects a stronger culture of safety within Saudi German Hospital and reinforces its commitment to delivering high-quality, reliable care.

Conclusion:
The implementation of the Hospital Safety Index (HSI) at Saudi German Hospital provided a rigorous, evidence-based framework for monitoring and measuring safety performance, thereby fostering a stronger culture of patient safety and supporting continuous quality improvement. By integrating structured assessments across critical domains, the HSI enabled systematic benchmarking and positioned SGH's performance in alignment with the highest national and international standards. This approach not only reinforced organisational accountability but also embodied the institution's vision of "Caring like family", ensuring that the delivery of healthcare services is both compassionate and uncompromising in quality. Collectively, these outcomes affirm that SGH accepts nothing less than excellence in safety and care, consolidating its role as a leader in patient-centred, high-reliability healthcare.

REPORT

APPLICATION OF ACHS INTERNATIONAL (ACHSI) PRINCIPLES

1. Consumer Focus
The Hospital Safety Index (HSI) was developed with patients at the heart of every standard, ensuring that care is consistently safe, accurate, and of the highest quality (Appendix 1). By aligning with both national and international patient safety priorities, the tool guarantees that hospital processes directly reflect consumer needs and expectations. Clear inclusion and exclusion criteria focus audits on areas where the risk of patient harm is greatest, while twice-monthly assessments with immediate corrective actions provide a rapid safeguard against potential safety issues. Results are transparently shared across clinical and non-clinical teams to strengthen accountability, and patient feedback together with incident reports are systematically incorporated into HSI updates. This approach ensures that consumer rights, wellbeing, and trust remain the central drivers of continuous safety and quality improvement. In addition, ongoing needs assessments, patient journey mapping, and satisfaction reviews ensure that present and potential consumers' expectations are clearly understood, with services continuously evaluated and redesigned from the patient's perspective to confirm that patients remain the priority in all hospital decisions. To support this, Patient Activation Measure (PAM) assessments were conducted across our hospitals, providing structured insights into patients' knowledge, skills, and confidence in managing their care, which further guided service improvements tailored to actual patient needs (Appendix 2).

2. Effective Leadership
Leadership engagement played a central role in the successful implementation of the Hospital Safety Index (HSI). Senior leaders endorsed the use of HSI as a structured tool for measuring compliance with patient safety and environmental standards, ensuring alignment with organisational priorities. Audit reports were mandated to be shared with leadership periodically, while all process owners of HSI domains were required to convene monthly to review findings, endorse corrective actions, and identify opportunities for improvement. These meetings were consistently attended by executive leaders, including the Chief Executive Officer (CEO), Chief Medical Officer (CMO), Chief Operating Officer (COO), and Chief Nursing Officer (CNO)—who collectively assumed accountability for sustaining continuous improvement in patient and staff safety. The CEO directly assigned dedicated staff to oversee corrective actions and ensure the timely closure of non-compliance issues, a directive that empowered frontline teams and reinforced a culture of safety.

At the system level, Corporate Quality leadership conducted periodic clinical governance audits, with a primary focus on HSI domains (Appendix 3). These audits were embedded in the corporate quality agenda and were designed to evaluate each branch separately on its compliance with HSI standards. This governance structure not only reinforced accountability at the branch level but also enabled benchmarking across the SGH network, ensuring consistency, transparency, and sustained improvement in patient safety outcomes. Beyond governance and accountability, leadership also provided a clear strategic direction by positioning the HSI as a core pillar of the hospital's patient safety agenda and integrating its results into the wider organisational performance framework. Senior leaders championed the ongoing enhancement of HSI methodologies, ensuring that new strategies and technologies were regularly adopted to strengthen patient safety and quality outcomes. To inspire and motivate the workforce, leaders actively recognised frontline contributions during review meetings, invested in

capacity-building programs, and encouraged staff at all levels to propose innovations. This created a culture where employees felt valued, empowered, and motivated to continuously contribute, develop, and learn—further embedding excellence in care provision and quality improvement across the organisation.

3. Continuous Improvement

The Hospital Safety Index (HSI) functions as a structured driver of continuous improvement by combining systematic measurement, timely feedback, and corrective action. Through twice-monthly audits and ongoing data collection, the tool generates reliable, longitudinal performance data that highlight both strengths and gaps in compliance across patient safety and environmental domains. Immediate dissemination of audit findings to process owners ensures rapid initiation of corrective measures, while periodic, graphically analysed reports provide leadership with actionable insights into emerging trends. By embedding these results into regular HSI review meetings and Quality and Patient Safety Committee discussions, the tool fosters accountability, supports evidence-based decision-making, and mobilises leadership resources to address barriers. This cycle of monitoring, analysis, feedback, and action not only sustains incremental improvement but also strengthens the hospital's safety culture, aligning performance with national and international quality standards (Table 1).

Table 1: Continuous Improvement through the Hospital Safety Index (HSI)

Component	Description	Evidence (Jan 2023 – Apr 2025)
Frequency of Measurement	Twice-monthly audits across patient safety and environmental domains.	>170 HSI audits conducted, generating longitudinal trend data.
Systematic Feedback	Immediate dissemination of audit results to process owners with defined timelines.	Non-compliance in fire safety drills, narcotic practice, and medical gas safety was corrected within 2 weeks following the HSI audit in two of the SGH branches ***(Appendix 4)***.
Performance Monitoring	Graphical trend analysis and branch benchmarking were presented in monthly leadership meetings	HSI compliance trends were reviewed by the CEO, CMO, COO, and CNO monthly.
Improvement Projects Triggered	Audit findings translated into targeted performance improvement initiatives	• Medication reconciliation compliance project (2023) • Infection control reinforcement campaign (2024) • Clinical alarm safety protocol redesign (2025)
Leadership Accountability	Executive leaders endorse corrective actions and allocate resources accordingly	The group CEO held the branches' CEOs accountable for directly handling the follow-up and closure of findings
Outcomes & Sustainability	Continuous cycle of measurement, corrective action, and re-measurement.	This continuous model improved the overall patient safety culture by 2% in 2023, and by 3% in 2024.

4. Evidence of Outcomes

The implementation of the Hospital Safety Index (HSI) across the Saudi German Hospital (SGH) network demonstrated consistent and sustained improvements in compliance over time, confirming its effectiveness as a structured monitoring and improvement framework. At the branch level, steady progress was observed across all eight facilities. In the Jeddah branch, overall compliance across HSI domains increased from 73% in January 2023 to 90% in April 2025. Comparable improvements were reported in other branches: Aseer (63% to 94%), Riyadh (70% to 87%), Madinah (83% to 92%), Hail (87% to 96%), Dammam (87% to 92%), Makkah (79% to 95%), and Hai Al Jamaa (83% in March 2024 to 93% in April 2025) (Figures 1-8). These sustained upward trends reflect the combined impact of leadership commitment, multidisciplinary collaboration, and active staff engagement in both clinical and non-clinical domains (Table 2).

Table 2: HSI Compliance Improvement Across SGH Network (Jan 2023 – Apr 2025)

Branch	Baseline Compliance	Latest Compliance	Measurement Period	Improvement
Jeddah	73% (Jan 2023)	90% (Apr 2025)	27 months	↑ +17%
Aseer	63% (Jan 2023)	94% (Apr 2025)	27 months	↑ +31%
Riyadh	70% (Jan 2023)	87% (Apr 2025)	27 months	↑ +17%
Madinah	83% (Jan 2023)	92% (Apr 2025)	27 months	↑ +9%
Hail	87% (Jan 2023)	96% (Apr 2025)	27 months	↑ +9%
Dammam	87% (Jan 2023)	92% (Apr 2025)	27 months	↑ +5%
Makkah	79% (Jan 2023)	95% (Apr 2025)	27 months	↑ +16%
Hai Al Jamaa	83% (Mar 2024)	93% (Apr 2025)	13 months	↑ +10%

Domain-specific analyses further underscore the clinical significance of HSI implementation. Venous thromboembolism (VTE) prophylaxis compliance improved from 70% to 80%, reducing the incidence of preventable blood clots and thereby lowering morbidity and mortality. Sedation safety and narcotic safety both reached near 100% compliance in approximately seven out of eight branches, ensuring safer administration, correct dosing, and rigorous monitoring of patients while minimising risks of medication errors, misuse, and diversion. Blood transfusion safety achieved 100% compliance across all branches by April 2025, guaranteeing adherence to international transfusion protocols and eliminating avoidable transfusion-related risks.

Infection prevention and control practices also strengthened, with isolation compliance increasing from 82% to 93%, supported by consistent improvements in hand hygiene and the use of personal protective equipment (PPE). These gains contributed to a measurable reduction in hospital-acquired infections, safeguarding both patients and healthcare workers. Medical consultation timeliness improved from 69% to 81%, ensuring that patients received appropriate specialist input without unnecessary delays, thus minimising risks associated with late diagnoses or interventions.

Procedural and perioperative safety demonstrated a significant increase from 85% to 95%, reflecting safer standards in anaesthesia, surgery, transfusion practices, and radiation safety. These improvements directly reduced the likelihood of intraoperative complications, transfusion errors, and radiation-related harm, thereby enhancing overall procedural safety. Similarly, patient care and clinical processes rose from 84% to 88%, strengthening core safety practices such as accurate patient identification, effective handover, and timely communication of critical results. This translated into measurable reductions in preventable falls, fewer pressure injuries, and improved reliability in continuity of care.

Collectively, these outcomes provide robust evidence that the HSI is not only a measurement tool but also a catalyst for continuous quality improvement. By embedding patient safety principles into daily practice, SGH was able to reduce risks, prevent avoidable harm, and align its performance with the highest national and international safety standards.

Figure 1: HSI Compliance in Saudi German Hospital – Jeddah

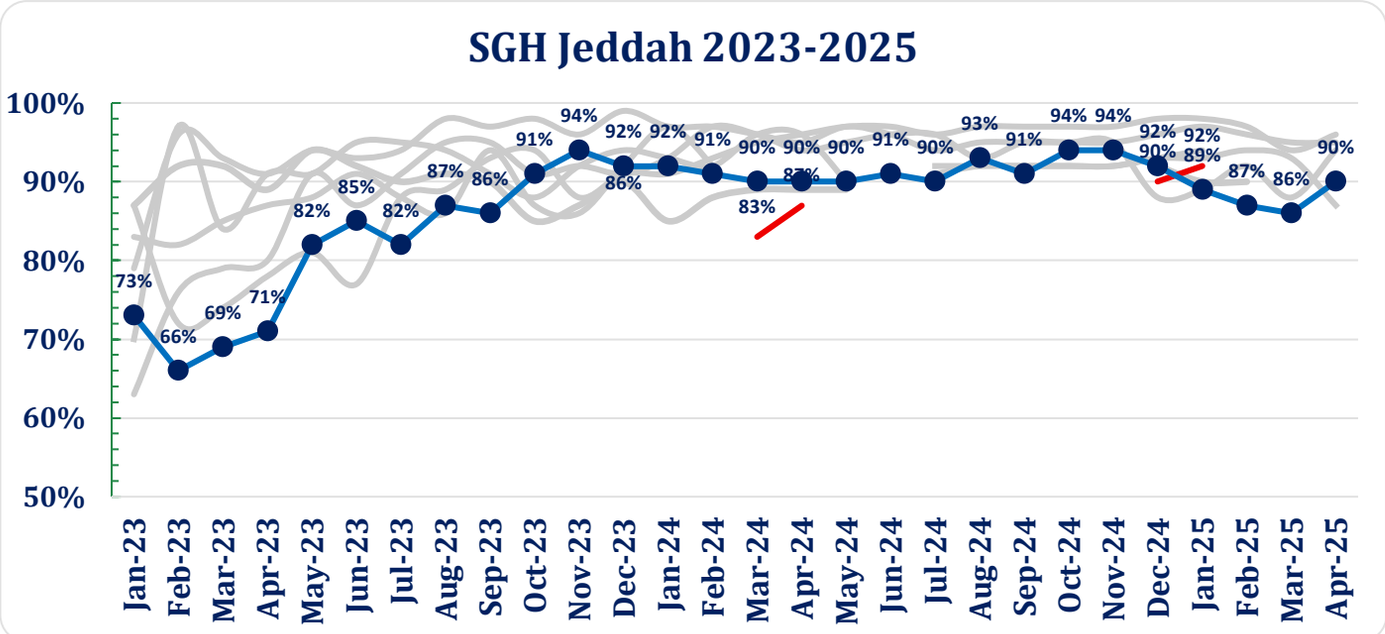


Figure 2: HSI Compliance in Saudi German Hospital – Asser

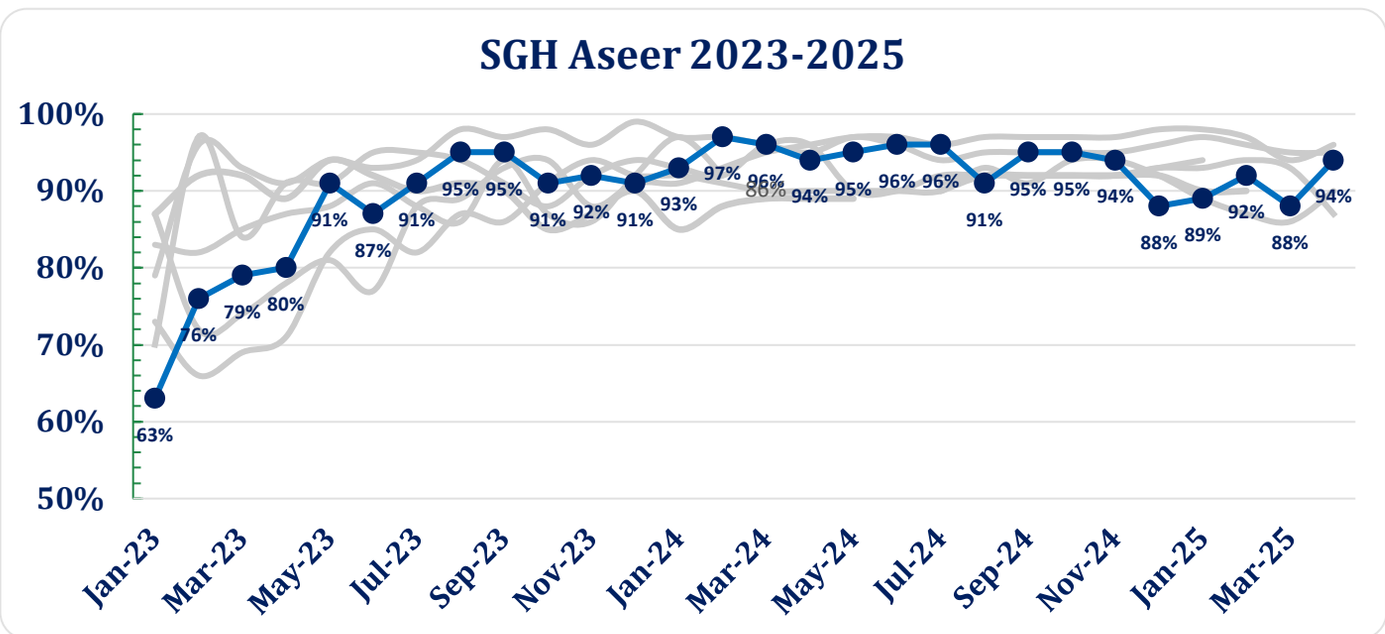


Figure 3: HSI Compliance in Saudi German Hospital – Riyadh

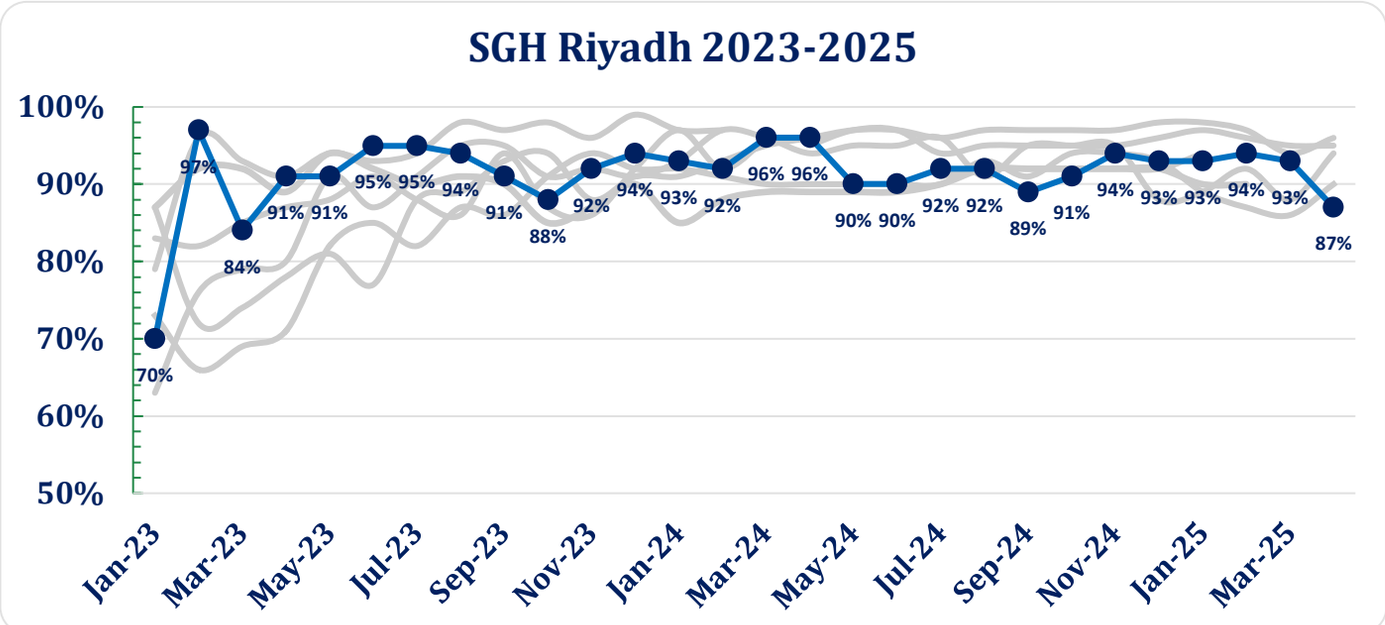


Figure 4: HSI Compliance in Saudi German Hospital – Madinah

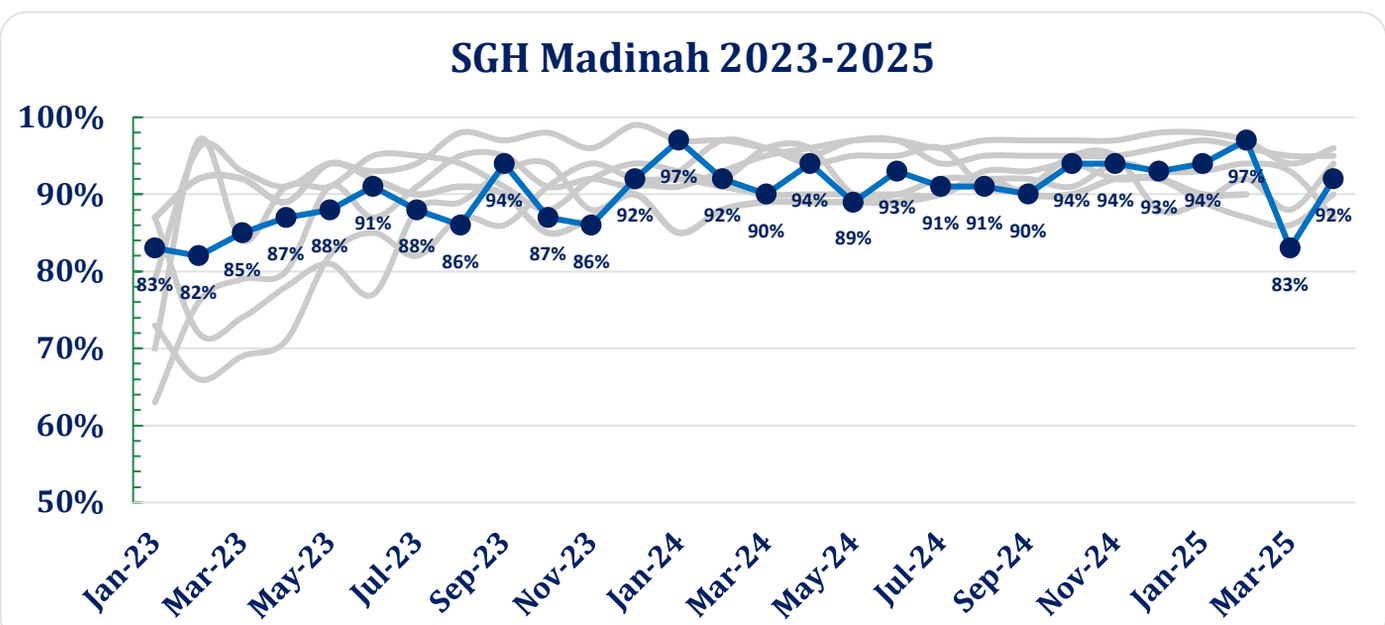


Figure 5: HSI Compliance in Saudi German Hospital – Hail

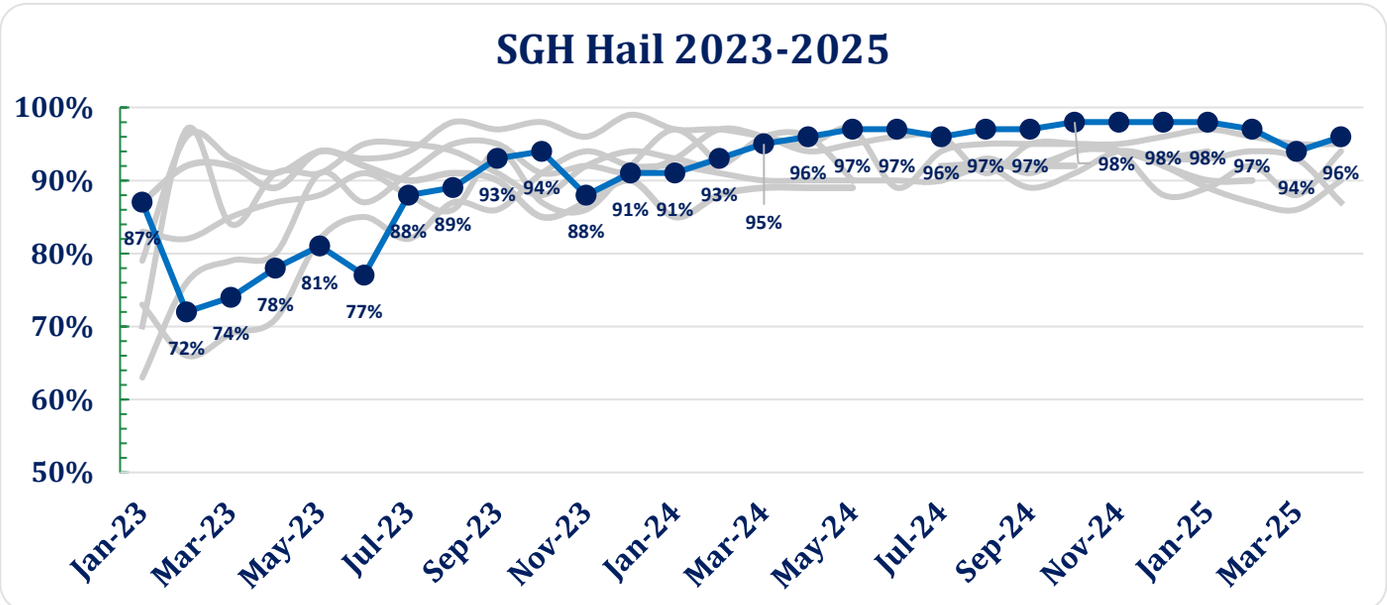


Figure 6: HSI Compliance in Saudi German Hospital – Dammam

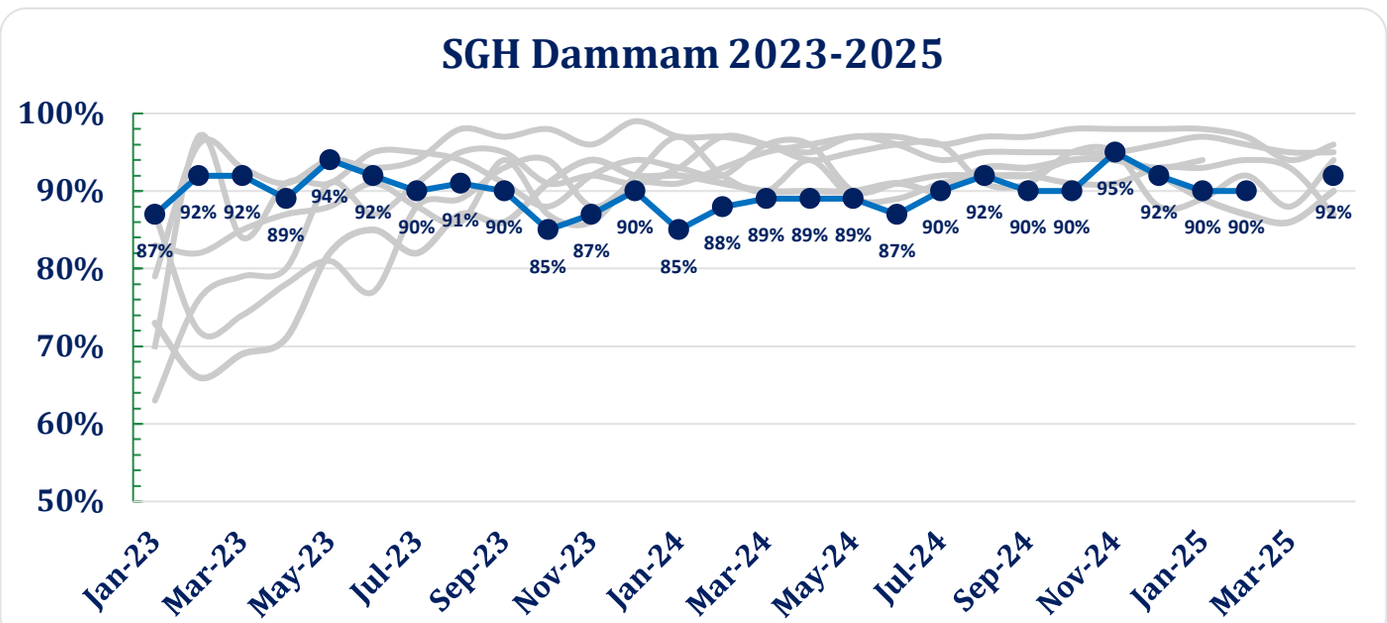


Figure 7: HSI Compliance in Saudi German Hospital – Makkah

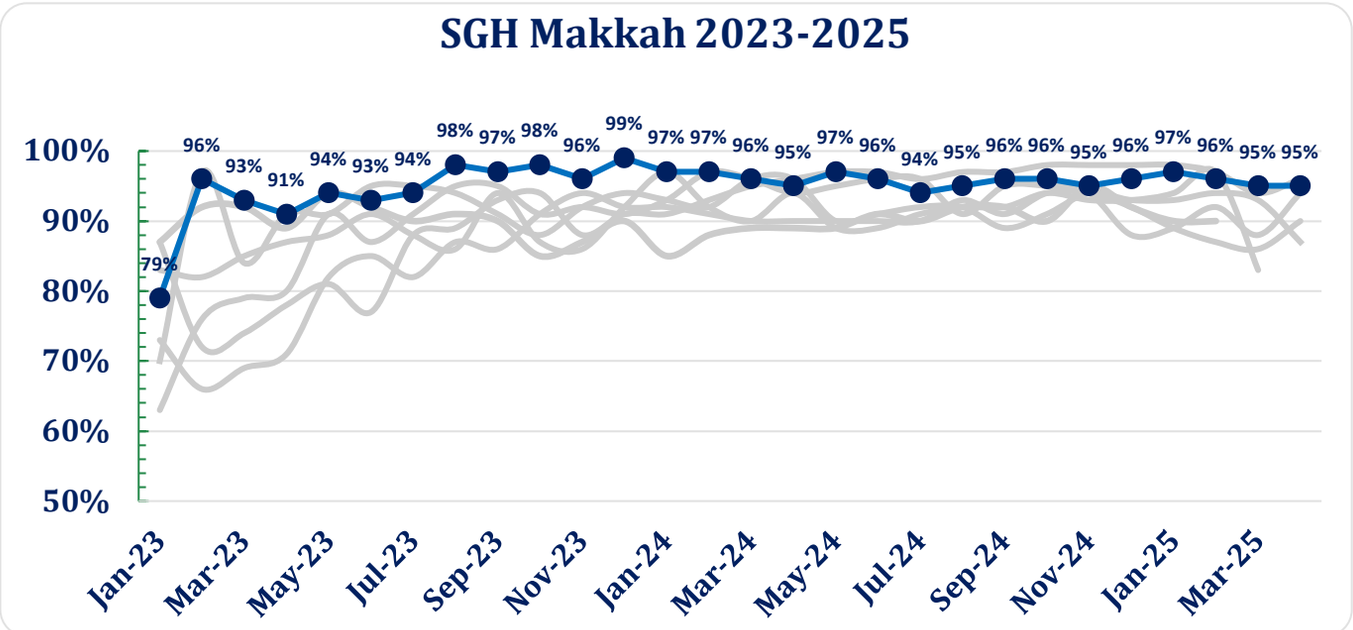
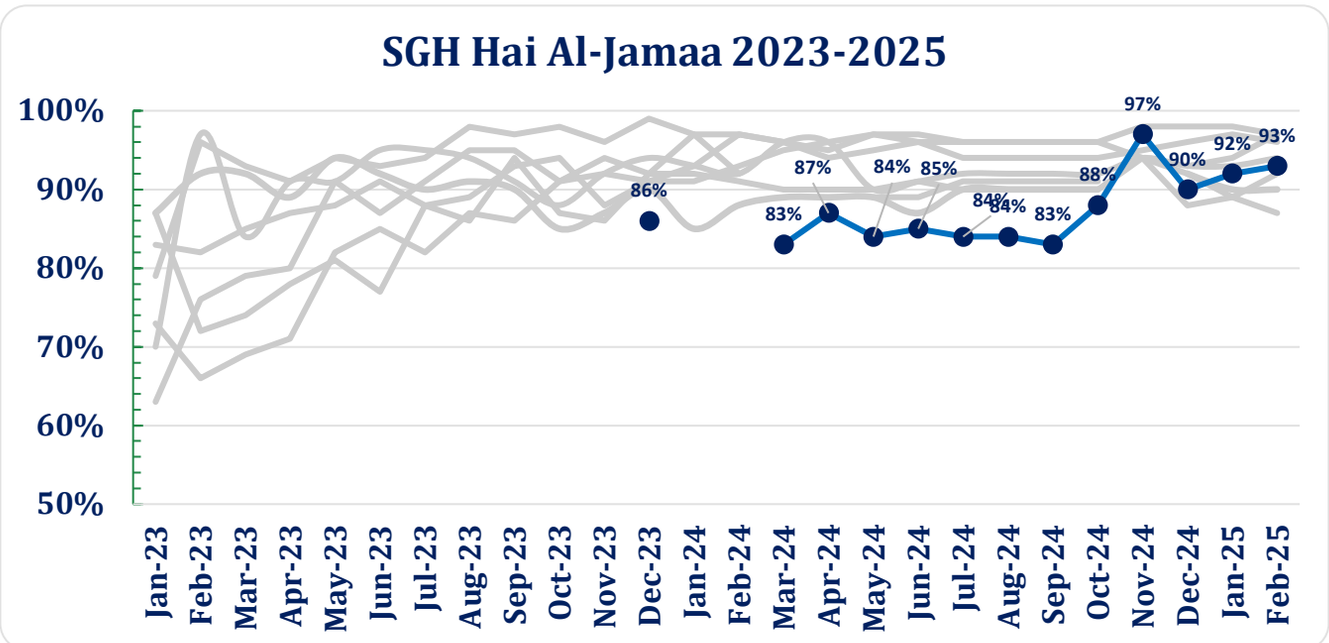


Figure 8: HSI Compliance in Saudi German Hospital – Hai Aljamaa



5. Striving for Best Practice

The implementation of the Hospital Safety Index (HSI) at Saudi German Hospital reflects a strategic commitment to adopting and sustaining best practices in patient safety and quality of care. By integrating national benchmarks such as MOH patient safety goals and CBAHI standards with international frameworks from JCI, WHO, AHRQ, the HSI enabled SGH to align its performance with the highest evidence-based standards. Continuous monitoring through twice-monthly audits, immediate corrective actions, and transparent reporting created a dynamic system of accountability that not only improved compliance but also nurtured a culture of safety across all branches. Moreover, the marked improvements in domains such as infection prevention, procedural safety, medication safety, and clinical governance demonstrate that the hospital's approach extends beyond compliance to embrace global best practices that protect patients from avoidable harm. This systematic

alignment reinforces SGH's vision of "Caring like family", where patient safety, trust, and high-quality outcomes remain at the centre of care delivery.

INNOVATION IN PRACTICE AND PROCESS

The Hospital Safety Index (HSI) represents a major innovation in how hospital safety and quality are monitored, evaluated, and improved across the Saudi German Hospital (SGH) network. Unlike traditional audits that were fragmented, reactive, and loosely connected to patient outcomes, the HSI provides a comprehensive, integrated, and high-frequency framework that unifies national standards (CBAHI, MOH) and international frameworks (JCI, WHO, AHRQ, OSHA) into a single cohesive system. Using risk-based prioritisation, domains were selected based on their proven link to harm prevention and clinical outcome improvement.

Innovation is evident in the precision of its audit methodology. Each domain is governed by explicit inclusion and exclusion criteria, standardised audit instructions, and defined corrective actions. For example, VTE prophylaxis audits are automatically scored as noncompliant if assessments occur more than 24 hours post-admission, directly tying compliance to patient safety. Noncompliance in any domain triggers immediate corrective action followed by re-audit, ensuring rapid closure of gaps. This level of standardisation makes audits consistent, reproducible, and actionable across all branches.

Another distinctive feature is the high-frequency monitoring cycle, with audits conducted twice monthly to enable near real-time detection and correction of safety gaps. The weighted scoring system (30% structural requirements, 70% direct patient safety outcomes) further enhances the innovation by ensuring that performance reflects outcomes most critical to reducing risk and improving care quality.

The measurable impact of HSI underscores its value in practice. Overall compliance improved steadily across all branches, with Jeddah rising from 73% in January 2023 to 90% in April 2025, Aseer from 63% to 94%, Makkah from 79% to 95%, and Hai Al Jamaa from 83% in March 2024 to 93% in April 2025. Domain-level gains were equally notable: VTE prophylaxis compliance increased from 70% to 80%, sedation and narcotic safety reached near 100% compliance in seven out of eight branches, and blood transfusion safety achieved 100% compliance across all branches by April 2025. These improvements translated into direct reductions in preventable harm, including hospital-acquired VTE, wrong-patient incidents, medication errors, and adverse events during sedation and transfusion.

Beyond measurable outcomes, the HSI has catalysed a cultural transformation in patient safety. Frequent, standardised audits have normalised safe practices as part of routine workflows, while real-time coaching reinforced learning and built staff ownership. This change is reflected in improved scores in the Saudi Patient Safety Culture Survey, confirming a stronger culture of accountability and continuous improvement. By embedding safety into daily operations and aligning SGH's performance with national and international benchmarks, the HSI stands as an innovative model of continuous quality improvement and a replicable framework for healthcare organisations seeking to elevate patient safety.

APPLICABILITY TO OTHER SETTINGS

The Hospital Safety Index (HSI) was conceived not only as an internal quality improvement initiative but as a scalable, adaptable, and replicable framework for strengthening patient safety across diverse healthcare environments. By integrating national (CBAHI, MOH) and international (JCI, WHO, AHRQ, OSHA) standards into a single system, and combining these with structured inclusion/exclusion criteria, standardised audit instructions, and risk-weighted scoring, the HSI provides a robust model that can be applied in any setting where measurable improvements in patient safety and clinical outcomes are sought.

Adaptability Across Healthcare Facility Types

The modular structure of HSI allows customisation according to facility type and risk profile. In primary care centers, emphasis can be placed on infection prevention, patient identification, medication safety, and emergency preparedness. In rural or remote facilities, standards can be tailored to focus on high-priority risks in resource-constrained settings. Ambulatory surgical centers may prioritise perioperative safety, sterilisation, and

postoperative monitoring. This flexibility enables facilities to select relevant domains while retaining standardised scoring and reporting methods.

Integration Across Multi-Site Networks
Within multi-site healthcare systems, the HSI can serve as a corporate-wide monitoring tool, providing a standardised method for benchmarking safety performance. Central quality teams can use comparative data to identify systemic risks, disseminate best practices from high-performing sites, and align branches with national or corporate safety strategies. A centralised dashboard supports governance and executive oversight, ensuring leadership maintains a real-time view of performance across facilities.

Alignment with Regulatory and Accreditation Systems
Because the HSI incorporates standards from multiple international frameworks, it can also function as a continuous accreditation readiness tool. Facilities in other countries may adapt the standard set to reflect local regulatory and accreditation requirements while preserving the HSI structure and scoring logic, reducing the need for multiple parallel audit systems.

Suitability for Low-Resource Settings
The HSI is designed for scalability, making it feasible even in facilities with limited manpower or technology. Audit frequency can be adjusted, inclusion criteria refined to target the highest-impact areas, and paper-based systems substituted for digital tools without compromising the framework's core principle of risk-based auditing with immediate corrective action.

Digital Transformation and Remote Application
In technologically advanced settings, the HSI can be integrated into electronic platforms and hospital information systems. This enables real-time data entry, automated weighted scoring, instant compliance reporting, and remote oversight across geographically dispersed sites—features particularly relevant to large health networks seeking centralised performance monitoring.

Interdisciplinary and Cross-Functional Use
The HSI was intentionally designed for use by multidisciplinary teams, including nursing, medical, allied health, biomedical engineering, facilities management, and infection control professionals. This cross-functional applicability makes it a transferable model for promoting shared accountability and breaking down silos in patient safety across different healthcare contexts.

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2. Ministry of Health (MOH) (2022) Saudi Patient Safety Goals and Healthcare Quality Standards. Ministry of Health, Riyadh, Saudi Arabia.

3. Organisation, P. A. H. (2019). Hospital Safety Index: Guide for Evaluators. Second Edition. 148-173. https://iris.paho.org/handle/10665.2/51448

4. World Health Organisation (WHO) (2017) Patient Safety: Making Health Care Safer. Geneva: World Health Organisation.

5. World Health Organisation (WHO) (2019) WHO Global Patient Safety Action Plan 2021-2030. Geneva: World Health Organisation.

APPENDIX

Appendix 1
Examples of some domains in the HIS

Hospital Safety Index (HSI) - 2025

Domain	Code	Criteria
Venous Thromboembolism (VTE) Prophylaxis	**VTE.0**	**VTE compliance rate in the hospital KPI is ≥ 90%, with the compliance rate being monitored regularly by the medical executive committee.**
	VTE.1	All admitted adult patients, including obstetric patients, had appropriate identification for the VTE risks within 24 hours of admission
	VTE.2	All admitted adult patients received appropriate timely measures to minimize the risk of VTE based on the risk category.
	VTE.3	The VTE risk is reassessed and managed whenever the patient's condition changes (e.g. post-operative, postnatal) and periodically every 30 days.
Patient Identification (ID)	**ID.0**	**Patient identification compliance is ≥ 90%**
	ID.1	An identification (ID) band is secured appropriately on the patient wrist.
	ID.2	At least two patient identifiers are used to identify patients correctly, including the labeling of patient's samples, medications, and dietary meals.
	ID.3	The patient is actively involved in the identification process by stating his/her name.
	ID.4	Newborns wear dual identification bands that match the mother ID band. The identification is verified by two nurses before leaving the nursery (room-in), upon handover to the receiving unit, and before returning the newborn to the nursery (room-out).
Clinical Privileges (CP)	**CP.0**	**The percentage of physicians with valid privileges is ≥ 90%, with the compliance rate monitored regularly by the credentialing and privileging committee.**
	CP.1	Clinical Privileges are valid, updated, and accessible in all clinical care units
	CP.2	Physicians are only allowed to perform within their approved clinical privileges.
Credentialing (CR)	**CR.0**	**The percentage of staff with valid and completed primary source verification is ≥ 90%, with the compliance rate monitored regularly by the credentialing and privileging committee.**
	CR.1	The hospital verifies all credentials from the original source.
	CR.2	The hospital maintains a valid SCFHS registration for all staff.
	CR.3	The hospital maintains a valid MOH license for all staff.
Anesthesia (AN)	**AN.0**	**The percentage of anesthetists certified in advanced life support, per age group served, is ≥ 90%**
	AN.1	A qualified anesthesiologist is available inside the operating theatre throughout the operation or procedure for each patient.
	AN.2	High-risk surgeries are overseen by the anesthesia consultant, including pediatric, cardiac, neuro, and transplantation surgeries.
	AN.3	An anesthesiologist is available and oversees care in the recovery room for all patients.
Sedation (SD)	**SD.0**	**Sedation is only performed by qualified privileged physicians**
	SD.1	Surgical or procedural anesthetic/sedation informed consent completed and signed.
	SD.2	Moderate and deep sedation is provided in areas with appropriate setup (e.g. monitor, crash cart, defibrillator, oxygen..etc.).
	SD.3	Sedation medications are given according to the appropriate dose range per age group.
	SD.4	Clinical staff assisting in sedation have advanced life support certification according to age group.

Appendix 2
The results of the PAM assessment conducted in 2024 across SGH

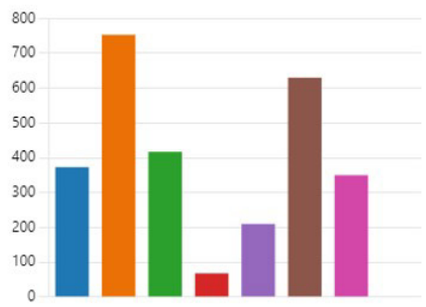
PAM (Patient Activation Measure) Baseline Results 2024

No. of Responses: 2514

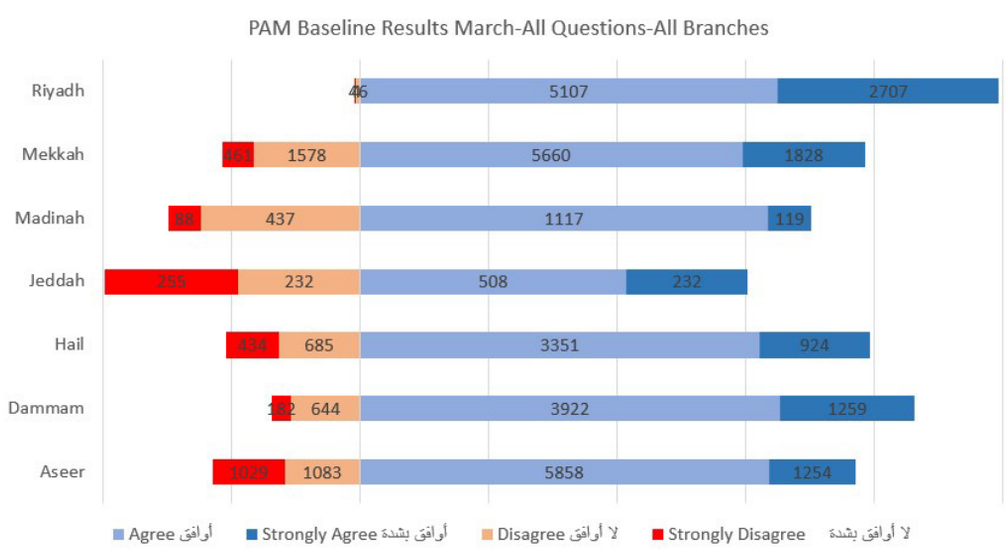
2. Question

More Details

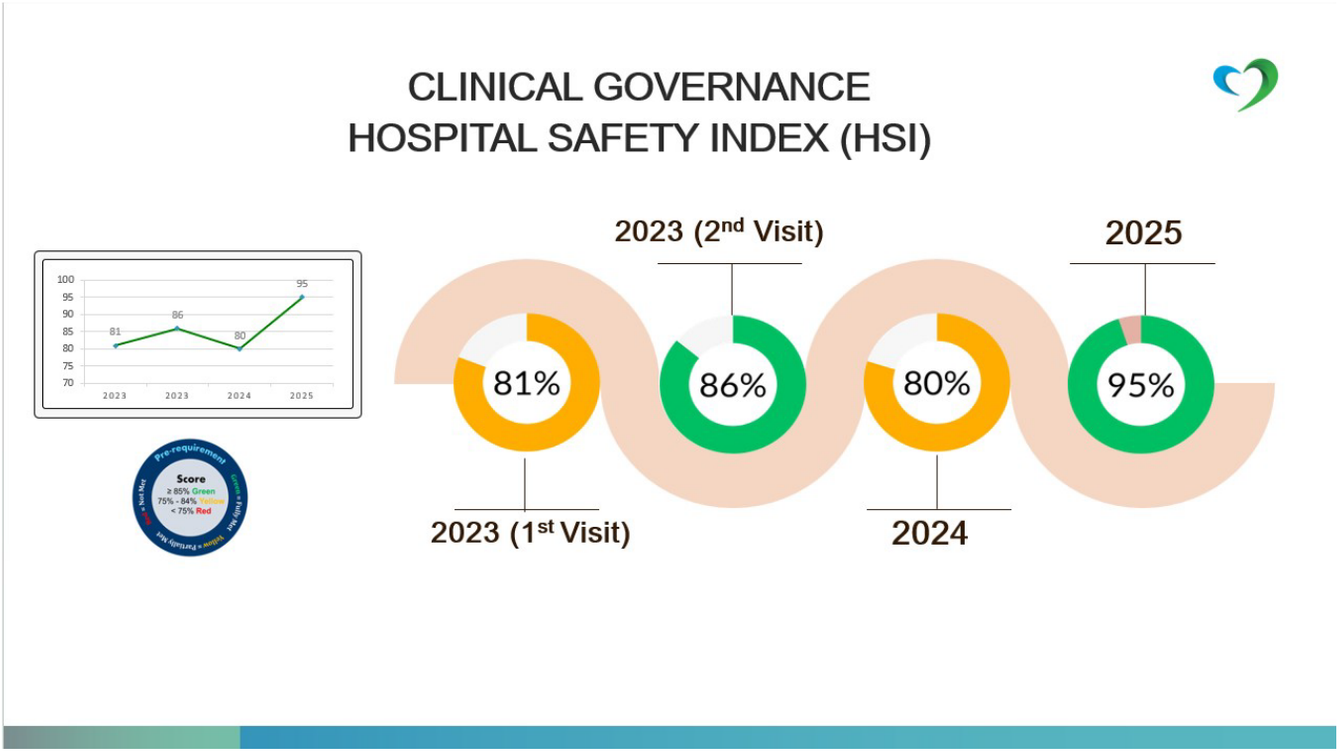
Dammam الدمام	373
Aseer عسير	753
Riyadh الرياض	417
Jeddah جدة	68
Madinah المدينة	210
Mekkah مكة	630
Hail حائل	350
Jeddah Hai Al Jamaa الجامعة حي...	0

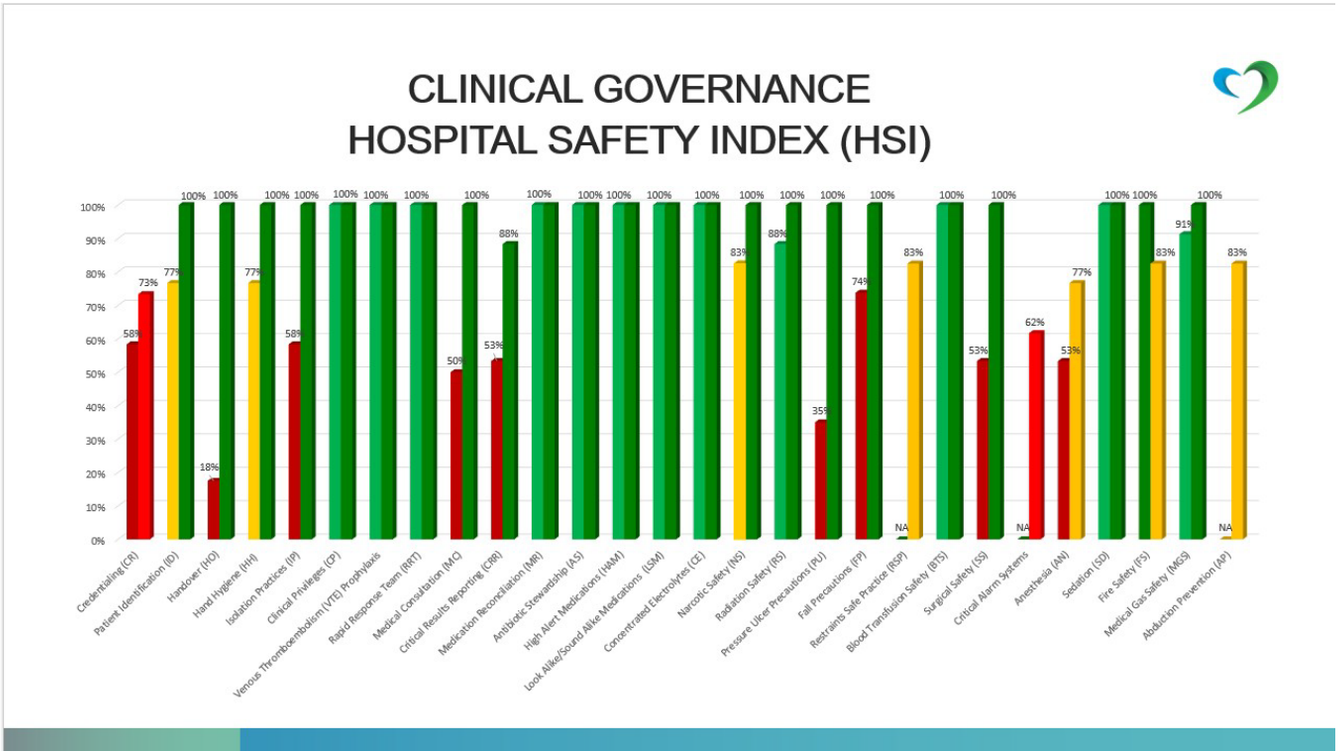


PAM (Patient Activation Measure) Baseline Results 2024



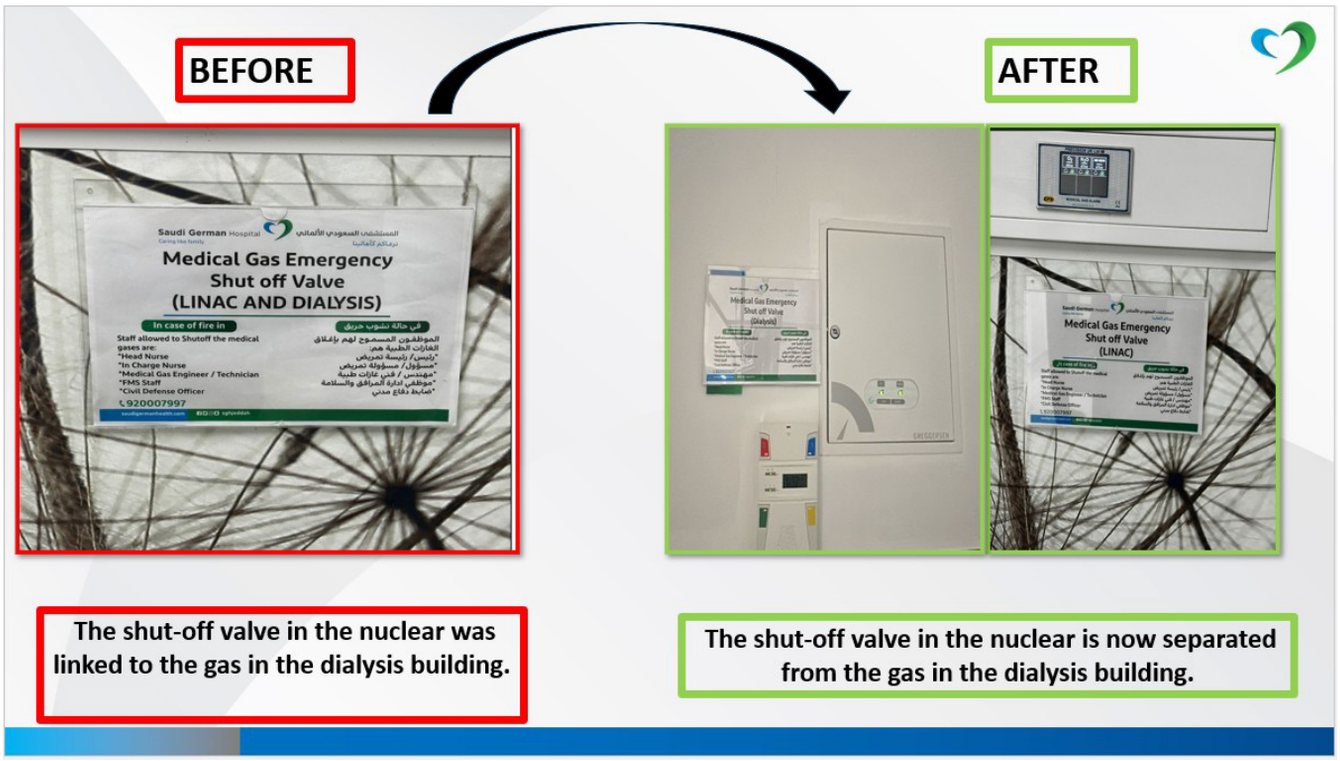
Appendix 3
Example of Clinical Governance Report on HIS in one of the SGH branches

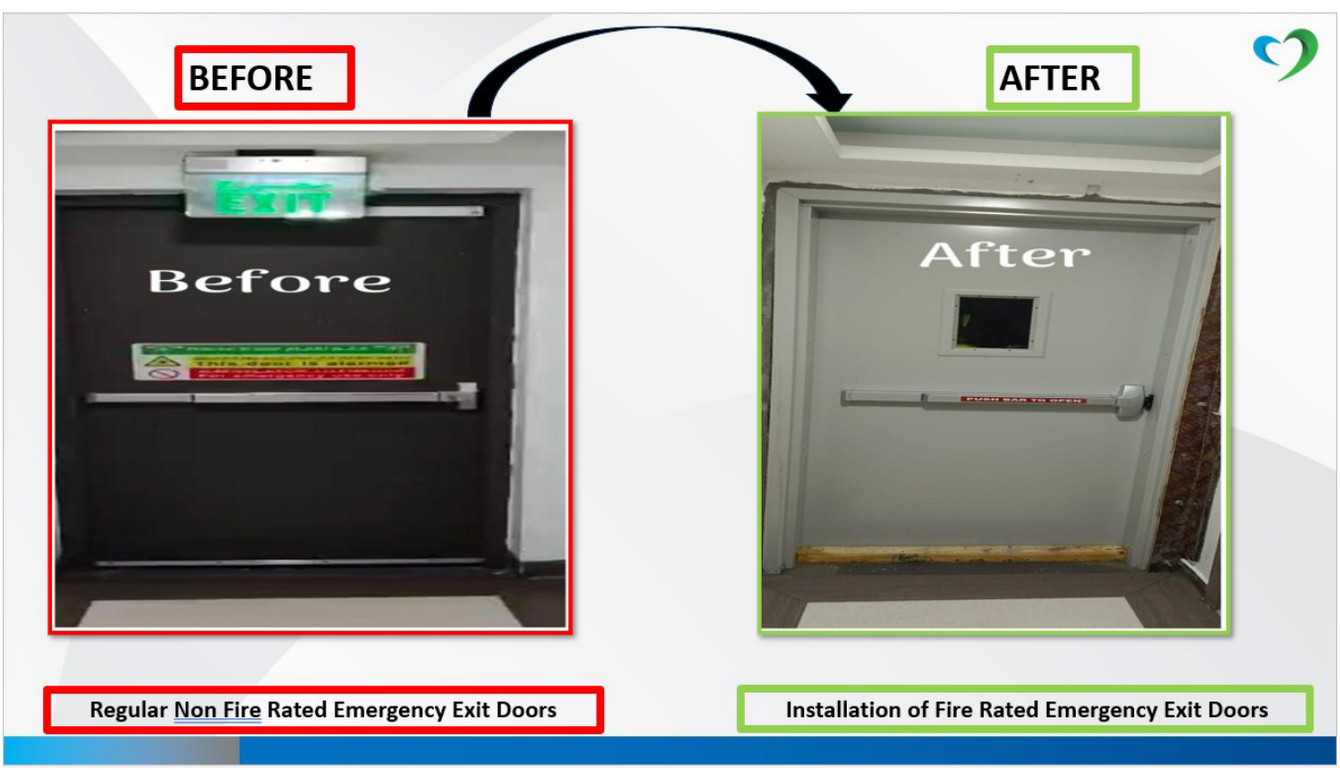




Appendix 4

Examples of Improvements Initiated Through HSI Findings Across SGH Branches





CLINICAL EXCELLENCE AND PATIENT SAFETY

HIGHLY COMMENDED

Dubai Health, UNITED ARAB EMIRATES

Patient Safety and Quality Department

Zero by Design: Data-Driven CAUTI Prevention in a Paediatric Hospital at DUBAI HEALTH

Mr. Adli Baroud, Dr. Walid Abuhammour, Ms. Priya Padmanabhan, Dr. Deborah Westwood, Dr. Hesham Abdalla, Ms. Yuser Hamad, Mr. Adel Sharadgah, Ms. Samah Abdel Hamid Faeq Darwazeh, Mr. Jithin Raj Rajendran Pillai, Mr. Amal Vimalan, Dr. Mohammed Amber Khan and Dr. Entesar Abdulla Sultan Ali AlHammadi

AIM

Reduce catheter-associated urinary tract infections (CAUTI) in AJCH paediatric inpatients from 6.8 to at or below 1.3 per 1,000 catheter-days by 31 January 2025, achieving a zero rate in January 2025.

SUMMARY ABSTRACT

Background:
Catheter-associated urinary tract infection (CAUTI) is a preventable source of harm that increases morbidity, length of stay, antimicrobial exposure, and costs—risks that are particularly consequential in paediatric populations. In July 2024, AJCH identified a spike in CAUTI cases (two cases in July; approximately five cases across the prior quarter), corresponding to a monthly rate of 6.8 per 1,000 catheter-days in July and a recent quarter performance that was inconsistent with organisational expectations for zero preventable harm. A rapid review revealed variation in placement indications, gaps in insertion and maintenance reliability, over-ordering of screening urine cultures, and inconsistent competency validation. The project was initiated as a time-bound, organisation-wide quality improvement (QI) intervention aligned to the ACHS Clinical Excellence and Patient Safety category, with strong Infection Prevention and Control (IPC) oversight.

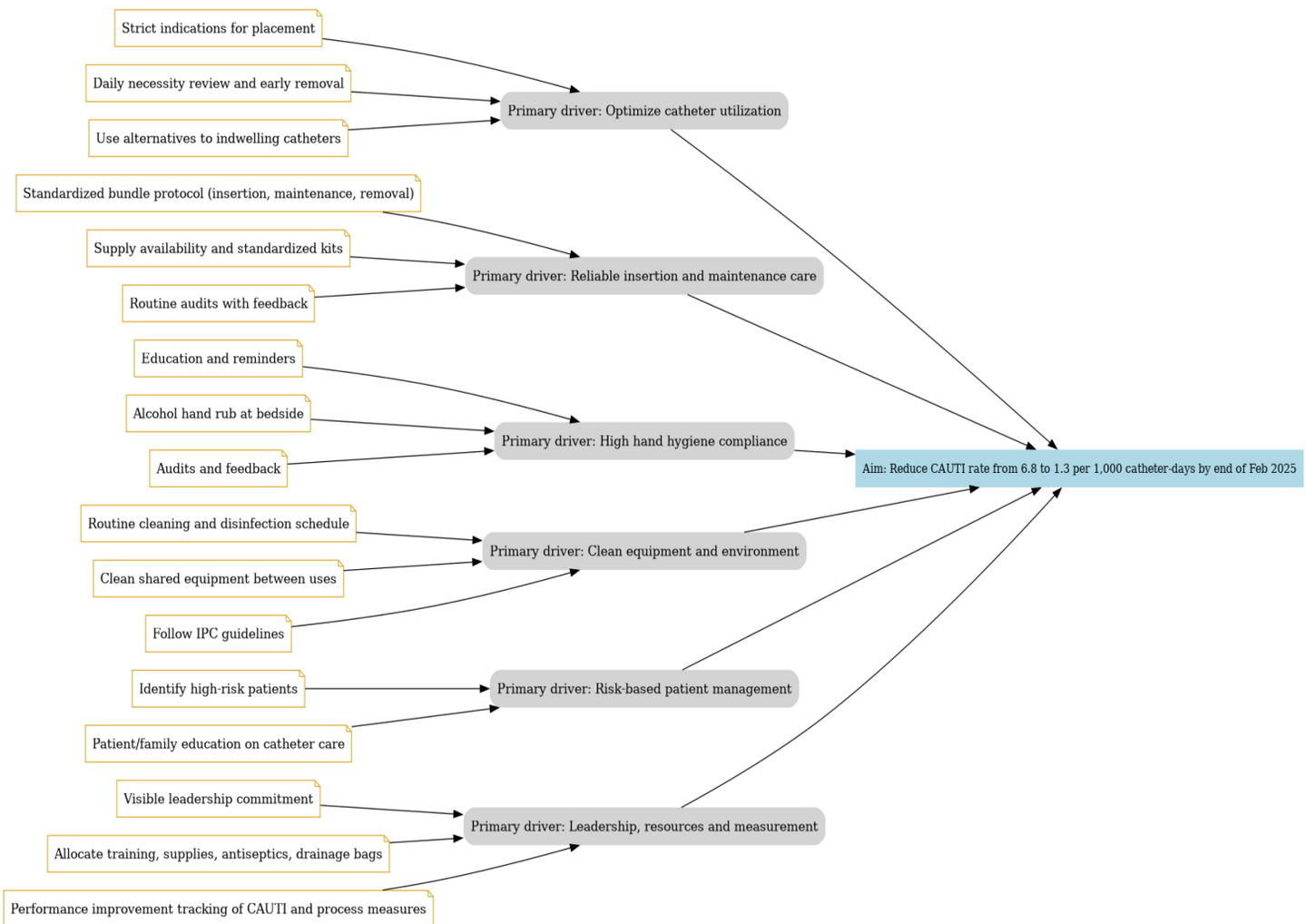
Objective:
The primary aim was to reduce the CAUTI rate in AJCH paediatric inpatient units from 6.8 to at or below 1.3 per 1,000 catheter-days by 31 January 2025, achieving a zero rate in January 2025. The scope included all paediatric inpatient areas where indwelling urinary catheters are used, excluding procedural areas and the ED. Secondary aims included reducing device utilisation, increasing bundle adherence and hand hygiene (HH) compliance, and improving urine culture stewardship to limit unnecessary testing. Balancing measures included urinary retention and re-catheterization events.

Method:
The project used a multi-pronged, evidence-based QI approach, combining:

- A key driver diagram to define drivers (appropriate indications, insertion/maintenance reliability, early removal, HH/environmental cleaning, culture stewardship).
- PDSA cycles to implement and iterate interventions.
- Competency validation and standardised supply kits to hardwire reliability.
- Measurement using run charts and statistical process control (SPC), specifically a u-chart for CAUTI per 1,000 catheter-days (variable n) and a p-chart for bundle adherence.
- Transparent feedback via unit dashboards and leadership governance through the IPC Committee.

Interventions:

- Indication and necessity: Deployed strict placement criteria with daily nurse-driven necessity review and removal protocols. Introduced a standardised removal checklist and bedside prompts.
- Insertion and maintenance bundle: Standardised insertion bundles (asepsis, securement, closed system) and maintenance bundles (peri care, unobstructed drainage, securement checks, sampling technique). Conducted competency validation for nurses and physicians with just-in-time refreshers.
- Supply standardisation: Created insertion and maintenance kits; aligned par levels; clarified ownership with Materials Management to avoid stockouts/substitutions.
- Urine culture stewardship: Introduced a decision-support workflow to reduce low-yield screening cultures (e.g., for non-specific fever without urinary symptoms), standardise sampling technique, and reduce contamination. Embedded prompts in the workflow and shared the AJCH Urine Culture Stewardship diagram.

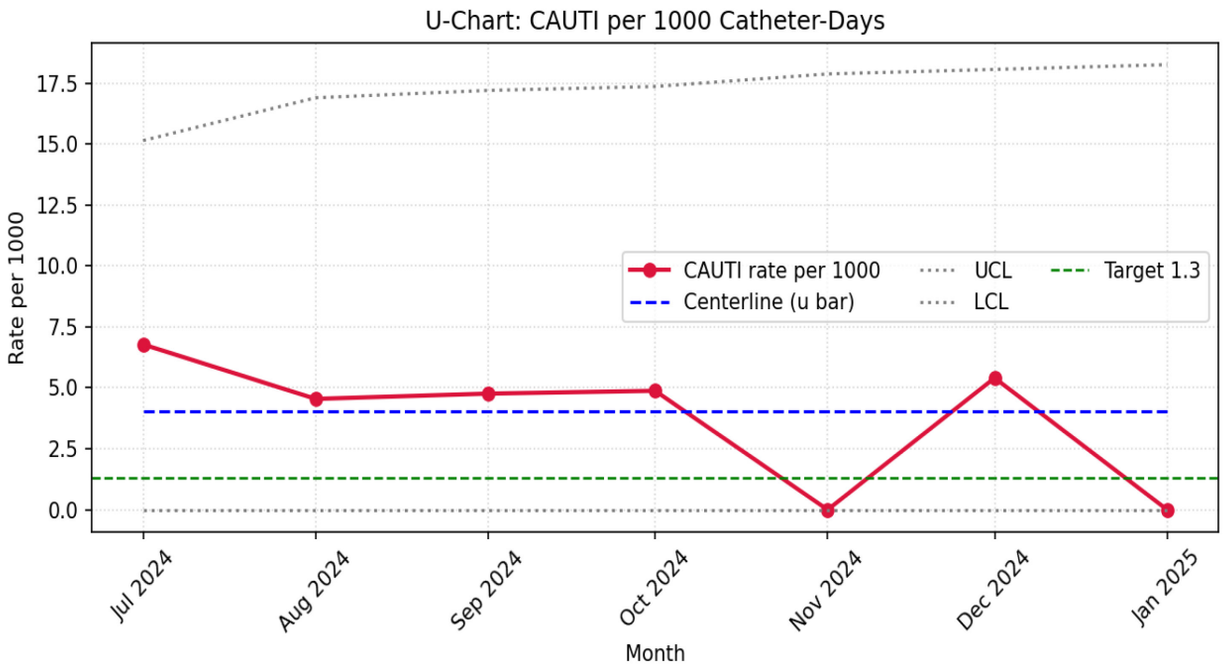


Measures:

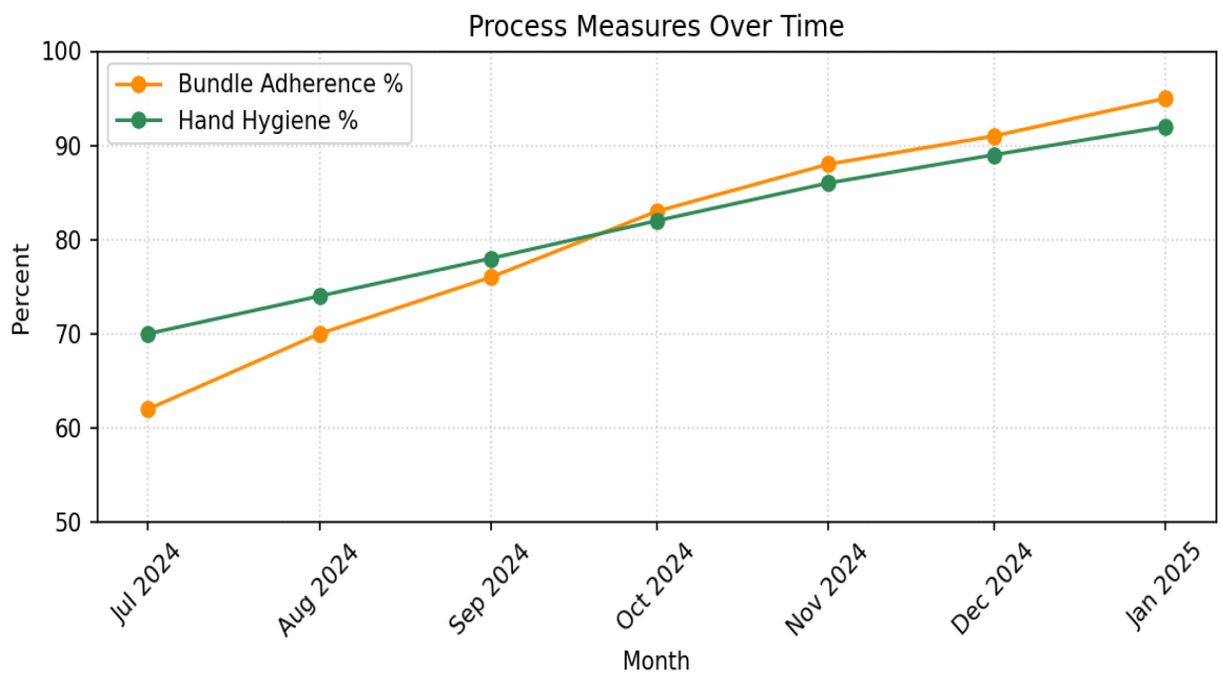
- Primary outcome: CAUTI rate per 1,000 catheter-days.
- Process measures: bundle adherence (%), hand hygiene (%), and device utilisation (%).
- Balancing measures: urinary retention and re-catheterisation within 72 hours of removal.
- Data set (Jul 2024–Jan 2025): catheter-days decreased from 295 to 180; CAUTI cases trended 2,1,1,1,0,1,0; monthly CAUTI rate declined from 6.78 to 0 per 1,000; bundle adherence rose from 62% to 95%; HH compliance from 70% to 92%; device utilisation from 14.5% to 11.5%. An SPC u-chart yielded a centerline of approximately 4.04 per 1,000, and a p-chart for bundle adherence yielded an overall centerline near 81%. January 2025 achieved a zero CAUTI rate.

Results:
By project close (January 2025), AJCH achieved the aim of zero CAUTI for that month while materially reducing risk exposure throughout the period:

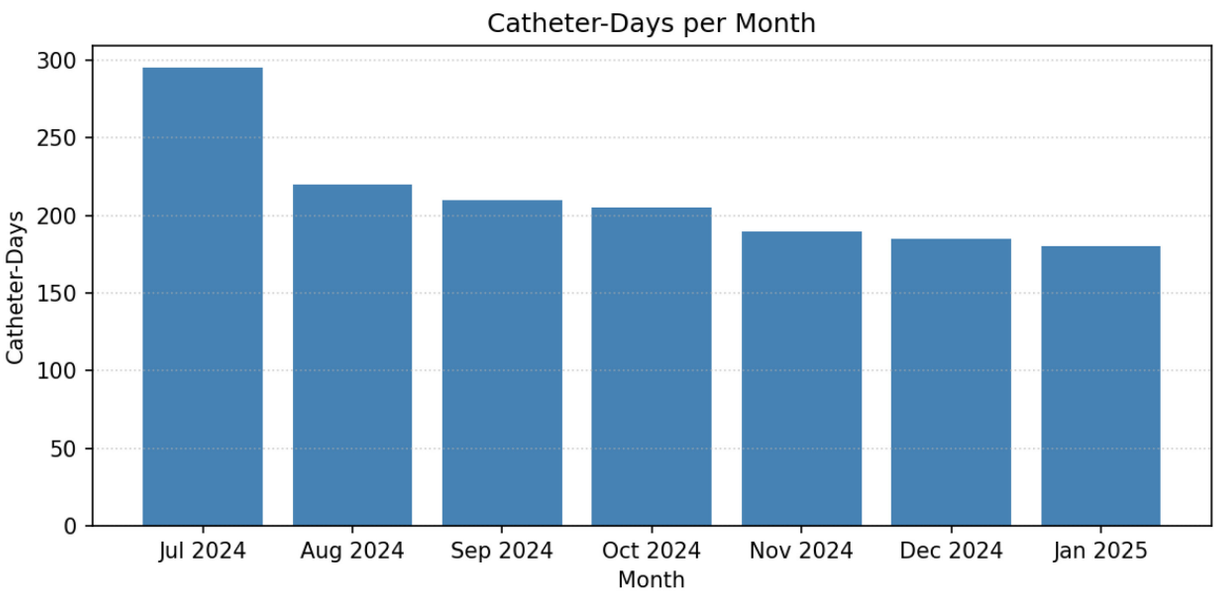
- Outcome improvement: The CAUTI rate decreased from 6.78 per 1,000 catheter-days in July 2024 to 0 in January 2025. The u-chart with variable denominators showed most data points below the centerline and narrowing control limits with decreasing exposure.



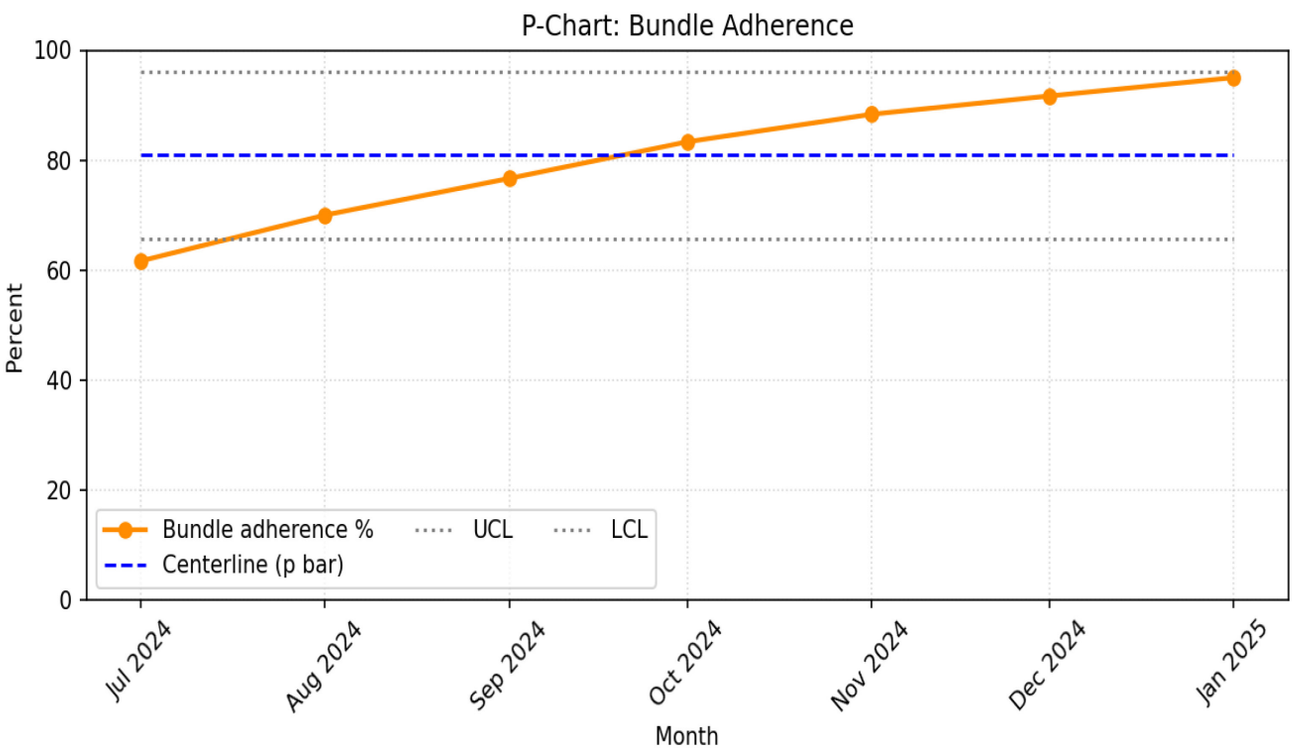
- Reliability gains: Bundle adherence improved from 62% to 95%; HH compliance from 70% to 92%, indicating strong process reliability supporting outcome improvement. The p-chart displayed steady upward movement bounded by control limits, reflecting real improvement beyond common-cause variation.



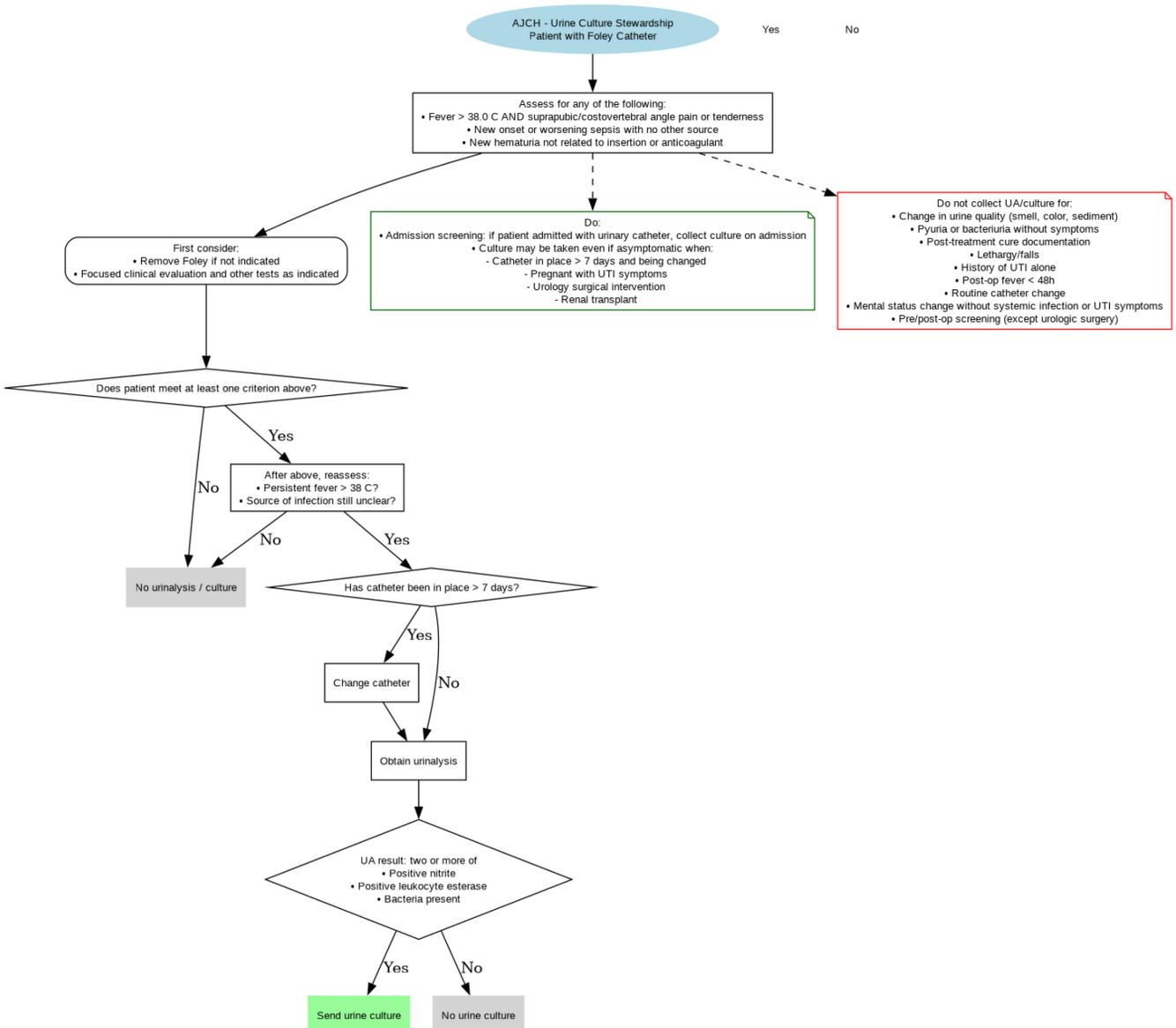
- Device use: Device utilisation decreased from 14.5% to 11.5%, suggesting safer practice via stricter indications and earlier removal.



- Balancing measures: No signal of increased urinary retention or re-catheterisation was observed during the period, supporting safety of early removal. No uptick in urine culture contamination was detected after standardising sampling technique.



- Culture stewardship: Reduction in low-yield screening cultures and better sampling technique were reflected in fewer unnecessary tests, improved specificity of positive results, and more targeted antibiotic use.



Patient, family, and staff engagement: Parents and caregivers were educated at the bedside on catheter necessity, care, and early removal benefits, and provided with multilingual materials where applicable. Staff engaged through unit huddles, visible run/SPC charts, and rapid feedback loops on defects and near misses. Nurse leaders championed the removal protocol, and physicians co-led insertion and diagnostic stewardship. This inclusive engagement facilitated behaviour change, adherence, and sustainment.

Innovation and transferability:

The project combined standard CAUTI best practices with pragmatic innovations:

- A nurse-driven removal protocol operationalised via daily prompts and checklists.
- A urine culture stewardship workflow integrating clinical criteria and sampling reliability to reduce over-testing.
- Visual management (driver diagram, fishbone, workflow) to clarify system drivers, failure modes, and safe pathways.

- SPC application (u- and p-charts) for interpretable, timely insight into special-cause signals. These elements are readily transferable to other paediatric and adult settings with adaptation for local indications, competencies, and HER prompts.

Sustainability and governance:
Sustainment was designed-in through:

- Policy integration of placement indications and nurse-driven removal.
- Ongoing competency validation for insertion/maintenance.
- Embedded supply kits and ownership by Materials Management.
- Routine auditing (bundle, HH, cleaning) with monthly dashboards and leadership review via the IPC Committee.
- Trigger-based review of any CAUTI occurrence, with structured learning and action tracking. Planned quarterly refreshers and continuous SPC monitoring will help maintain gains and detect early drift.

Equity, safety, and value:
The intervention reduced preventable harm without evidence of unintended consequences, while supporting equitable care through consistent standards and language-accessible patient education. Anticipated value includes lower antimicrobial exposure, fewer complications, and potential reductions in length of stay and consumable costs via reduced catheter-days and fewer unnecessary cultures.

Conclusion:
AJCH realised a clinically meaningful and measurable reduction in CAUTI risk, culminating in a zero rate in January 2025, by aligning evidence-based bundles, nurse-driven early removal, urine culture stewardship, and rigorous SPC-guided feedback. The project demonstrates Clinical Excellence and Patient Safety through reliable processes, visible governance, and transparent measurement—offering a scalable model for harm reduction and safer paediatric care.

REPORT

APPLICATION OF ACHS INTERNATIONAL (ACHSI) PRINCIPLES

1. Consumer Focus
Putting patients and families at the center of care shaped every design choice in this CAUTI prevention initiative. The core consumer promise was simple: eliminate preventable harm associated with urinary catheters by ensuring they are used only when clinically indicated, inserted and maintained to the highest standard, and removed at the earliest safe opportunity. We recognised that paediatric patients are uniquely vulnerable to catheter-related harm—discomfort, mobility limitation, infection risk, and downstream antibiotic exposure—so the project was framed around dignity, safety, and family partnership.

Respecting preferences and minimising harm

- We codified evidence-based indications that default to avoidance of catheters unless absolutely necessary. By reducing device utilisation, we reduced the likelihood of infection and improved comfort and mobility.
- Nurse-driven early removal empowered the bedside team to reassess daily with the family present, using simple language to explain why removal improves patient comfort and safety.
- Where monitoring or fluid management was necessary, we prioritised non-invasive alternatives (bladder scans, diaper weighing, timed voiding) to preserve comfort and reduce harm.

Family engagement and transparent communication

- Nurse-driven early removal empowered the bedside team to reassess daily with the family present, using simple language to explain why removal improves patient comfort and safety.
- Where monitoring or fluid management was necessary, we prioritised non-invasive alternatives (bladder scans, diaper weighing, timed voiding) to preserve comfort and reduce harm.

Language, equity, and access

- Patient and family education materials were simplified and made available in multiple languages common to our catchment area. Visual handouts (iconography for insertion, maintenance, and removal) supported low-literacy communication.
- The project removed discretionary variability, which often burdens families with lower health literacy. By standardising indications and escalation paths, every child received consistent, high-reliability care irrespective of unit, shift, or provider.

Stewardship to avoid unintended consequences

- The urine culture stewardship pathway protected families from the downstream risks of false positives, unnecessary antibiotics, and prolonged stays. Avoiding low-value tests also reduced out-of-pocket costs and discomfort.
- Balancing measures (urinary retention, re-catheterisation) were monitored to ensure that earlier removal did not create new harms. Family-reported discomfort and mobility were included in narrative review of cases.

Ongoing feedback loops with consumers

- Post-discharge calls after any catheter-related event ensured timely follow-up and allowed us to incorporate the family experience into our learning system.
- Family advisors reviewed education materials and provided feedback on readability and tone, which informed iterative revisions.

Consumer-centred value was thus operationalised as less harm, less discomfort, clearer communication, and fewer unnecessary interventions—delivered reliably through standard work and measured for accountability.

2. Effective Leadership

Clear aims and visible sponsorship

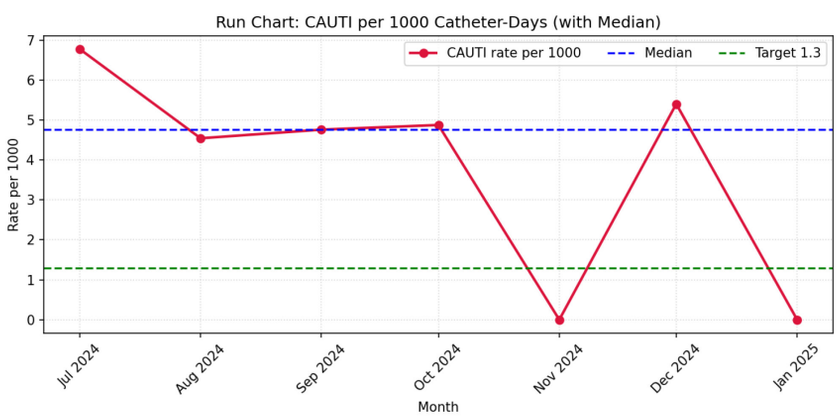
- Leaders endorsed a time-bound aim to reduce CAUTI to at or below 1.3 per 1,000 catheter-days by January 2025, achieving a zero rate in that month. This created urgency and alignment across departments.
- Executive sponsors cleared operational barriers quickly (e.g., procuring standardised insertion kits, enabling EHR prompts, dedicating educator time for competency validation).

Multidisciplinary structure with defined accountabilities

- The project team included nursing (bedside and educators), paediatrics, anaesthesiology, IPC, microbiology, pharmacy/antimicrobial stewardship, environmental services, and quality analytics.
- A named physician lead and nurse lead coordinated PDSA cycles, data reviews, and escalation plans. Unit champions ensured local adoption and served as peer mentors.

Data transparency and routine review

- Monthly dashboards included outcome, process, and balancing measures, reviewed at the IPC Committee, disseminated to units, and discussed at huddles.
- SPC and run charts (U-chart for CAUTI per 1,000 catheter-days; P-charts for bundle and hand hygiene; device utilisation trend) supported signal detection and early response to special-cause variation.



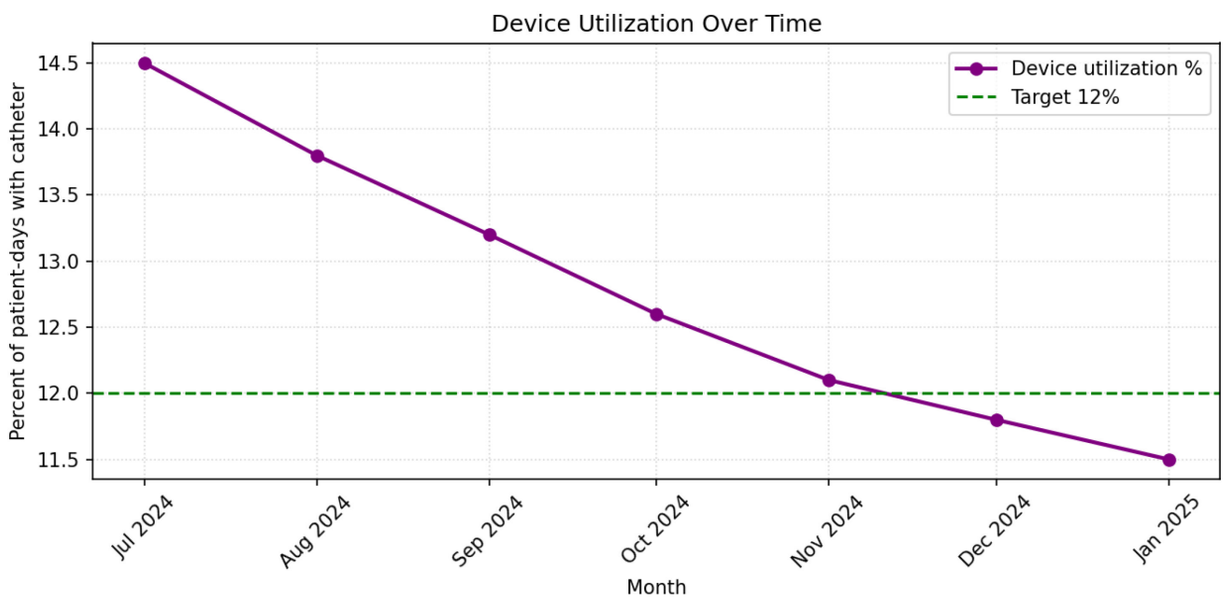
Building capacity and capability

- Leaders invested in competency validation for insertion and maintenance, with simulation checklists and precepting. Staff were empowered to halt procedures if asepsis was compromised.
- Educators restructured onboarding and annual competencies to include the CAUTI bundle and urine culture stewardship pathway.

Accountability with just culture

- When process lapses occurred, leaders used a non-punitive, learning-focused review. The daily management system captured issues and tracked countermeasures, ensuring follow-through.
- Unit-level performance was shared with pride and humility, celebrating improvements and quickly mobilising help where reliability dipped.

Through this leadership model, the organisation translated strategic intent into frontline reliability, making improvement the work of every shift, not the exceptional work of a few.



3. Continuous Improvement

We applied a structured, iterative improvement methodology grounded in PDSA cycles, measurement for learning, and rapid feedback loops. Each driver in our key driver diagram—appropriate indications, insertion/maintenance reliability, early removal, hand hygiene/environmental cleaning, and urine culture stewardship—was addressed with targeted change ideas and short-cycle tests.

Theory of change and driver diagram

- A concise driver diagram clarified the causal logic from interventions (e.g., standardised kits, indication checklists, remove-by dates, culture criteria) to intermediate process reliability to final outcomes (reduced CAUTI).
- This shared mental model anchored every PDSA, preventing diffusion and ensuring we measured what mattered.

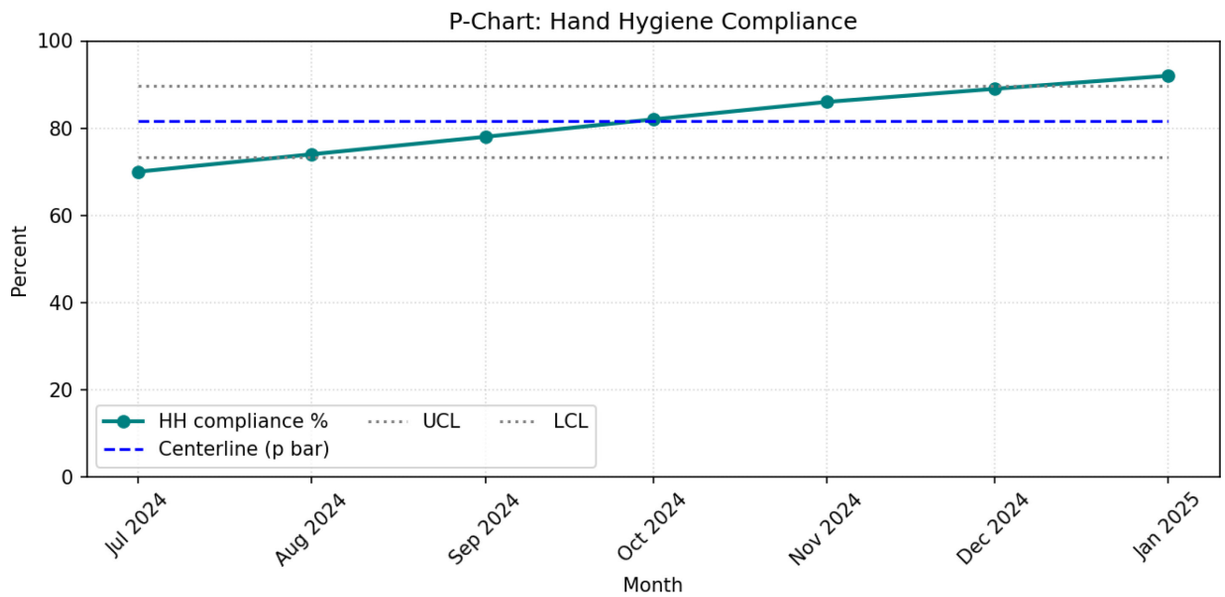
PDSA cycles across drivers

- Appropriate indications: Trailed a one-page indication checklist in two units, refined prompts, then integrated into EHR order sets. Daily device rounds were tested in one unit before scaling.
- Insertion/maintenance reliability: Piloted a sterile insertion kit with a visual checklist taped to the tray; refined layout and added a coach role during high-risk insertions; expanded to all paediatric units.
- Early removal: Implemented nurse-driven removal using explicit criteria, plus a remove-by date at time of insertion; iterated language and visual prompts on the line label.

- Hand hygiene and environment: Reinforced audit cadence and coaching feedback; added reminders at room entry/exit; used peer observers to increase reliability.
- Urine culture stewardship: Introduced a decision pathway to avoid low-yield cultures; integrated microbiology review for positive results and feedback on collection quality.

Measurement for learning

- Run charts with medians supported quick detection of shifts and trends. The additional figures displayed—run chart with median for CAUTI, P-chart for hand hygiene, device utilisation trend, and a Pareto analysis—helped target effort to the few vital faults contributing most to risk.
- SPC centerlines were recalculated after sufficient data points to avoid over-interpreting random noise. Where counts were very low, we used caution and complemented SPC with narrative reviews.



Feedback, coaching, and recognition

- Unit champions received monthly reliability snapshots and coached peers using real examples (photos of correct setup, annotated checklists).
- Leadership recognised teams achieving high bundle adherence and safe early removal, fuelling positive momentum and peer diffusion.

Learning system and scale-up

- We treated each CAUTI and catheter-related harm as a critical learning opportunity. Mini-root cause analyses fed into the Pareto, and countermeasures were prioritised for scale.
- Once stable at small scale, we standardised through policy, EHR order sets, and supply-chain changes to lock in gains.

Continuous improvement wasn't an event; it was an everyday practice, translating into better process reliability and safer outcomes within months.

4. Evidence of Outcomes

We triangulated outcomes (CAUTI per 1,000 catheter-days), process measures (bundle adherence, hand hygiene), and balancing measures (urinary retention/re-catheterisation, culture utilisation) to produce a coherent effectiveness story.

Outcome: CAUTI rate per 1,000 catheter-days

- The U-chart shows the centerline and dynamic control limits based on monthly catheter-days. The series trends downward with a zero rate in January 2025. While CAUTI is a low-frequency event, the decline and sustained low counts align with improved reliability in upstream processes.

- The run chart with median provides a simple, accessible visualisation for frontline teams, marking a shift from earlier variability to consistently low rates.

Process measures: bundle adherence and hand hygiene

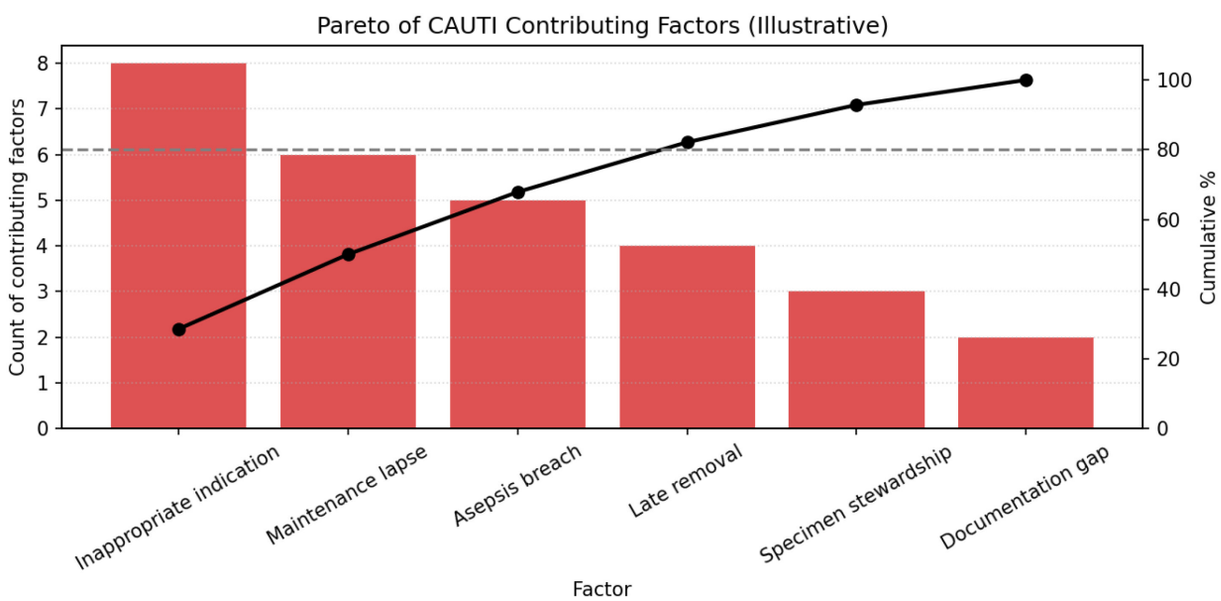
- The bundle adherence P-chart indicates progressive improvement from the 60s to 90s, with a p-bar around the low 80s and stability within control limits as reliability increased.
- The hand hygiene P-chart demonstrates increasing compliance into the high 80s and low 90s, with centerline and limits providing context for monthly fluctuations. These gains correlate temporally with the outcome improvements.

Exposure and risk reduction: device utilisation

- The device utilisation trend illustrates steady reduction toward a 12 percent target, reflecting consistent application of appropriate indications and early removal.
- Lower device-days reduce the denominator for potential harm, complementing process reliability improvements.

Learning focus: Pareto of contributing factors

- The Pareto analysis highlights the few vital contributors—such as inappropriate indication and maintenance lapses—that drove most risk. This enabled targeted countermeasures: refining indication checks, reinforcing maintenance technique, and enhancing coaching during insertions.



Balancing measures

- Unit reviews monitored urinary retention and re-catheterisation events, no signal suggested systematic harm from early removal. We also tracked urine culture utilisation to ensure stewardship did not miss clinically indicated testing.

Sustainability signals

- Embedding changes in policy, EHR, supply chain, and competencies suggests sustainment beyond the project period. SPC monitoring will continue to detect early drift and support timely response.

Taken together, the evidence demonstrates a credible, clinically meaningful reduction in CAUTI risk, with upstream reliability and risk exposure trending in the right directions, culminating in zero events in January 2025.

5. Striving for Best Practice

This initiative aligned tightly with established best practice guidance and advanced a high-reliability model tailored to paediatrics.

Alignment with evidence-based guidelines

- Practices reflect CDC/HICPAC and SHEA/IDSA consensus: stringent indications, aseptic insertion, closed drainage, unobstructed flow, securement, maintenance bundle compliance, and early removal.
- Stewardship aligned with Choosing Wisely to avoid low-value urinary cultures, minimising antibiotic overuse and false-positive cascades.

High-reliability design features

- Standardisation: Dedicated catheter insertion kits with visual checklists reduced variation; maintenance checklists and securement supplies were co-located for easy access.
- Forcing functions and prompts: EHR order sets embedded indications; remove-by labelling created a visual stop-the-line cue; daily device rounds ensured reassessment.
- Competency and coaching: Simulation-based validation for insertion and maintenance; bedside observers provided real-time feedback to close performance gaps.
- Visual management: Unit dashboards and huddle boards displayed current results; run charts and SPC figures were used in daily and monthly discussions.

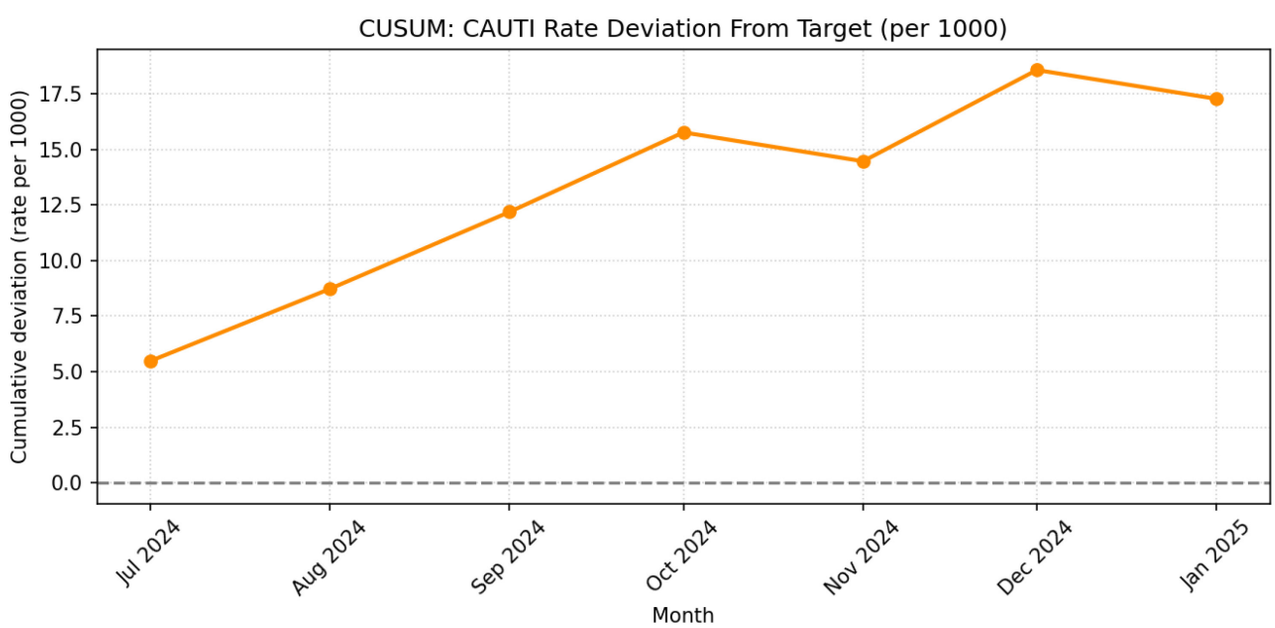
Data-driven decision-making

- SPC methods (U- and P-charts) differentiated signal from noise despite low counts, preventing overreaction to random variation and focusing effort where it mattered most.
- The Pareto guided prioritisation—solving the biggest contributors first creates disproportionate impact.

INNOVATION IN PRACTICE AND PROCESS

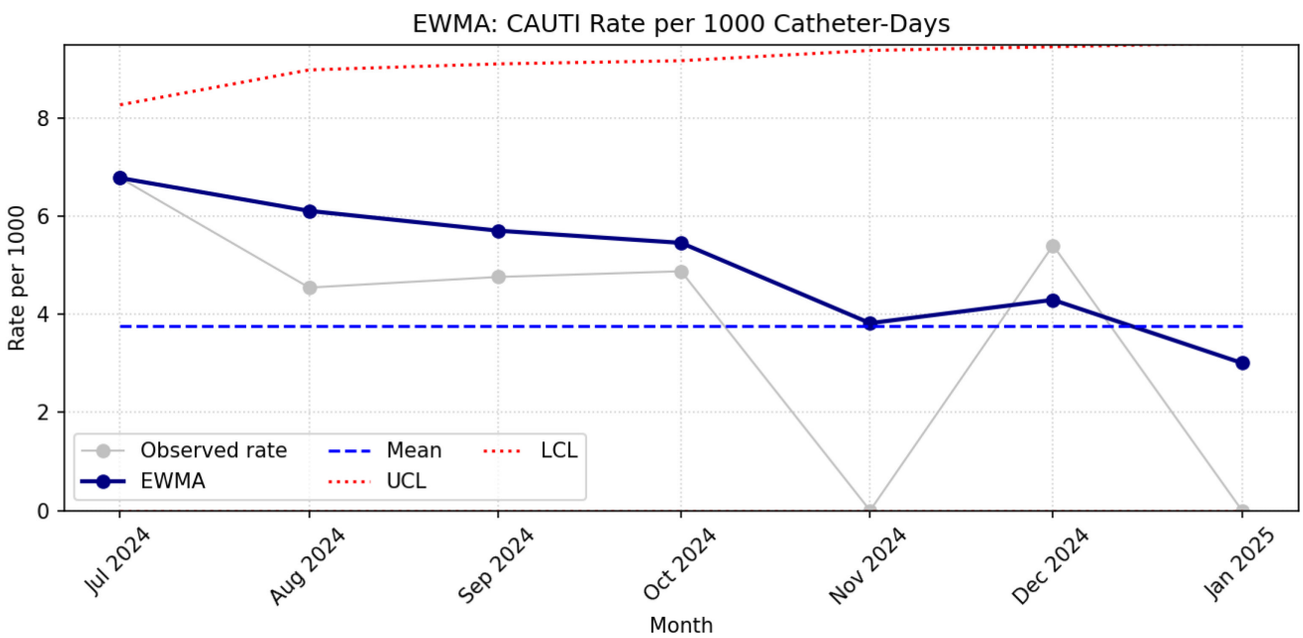
This program introduced several innovations:

- Nurse-driven early removal protocol with daily automatic prompts: Shifted removal authority to the bedside, reducing delays and device-days without waiting for physician orders.
- Right-test, right-time urine culture stewardship: Algorithm and order-panel redesign reduced unnecessary cultures, mitigating false-positive CAUTI and antibiotic overuse.
- High-reliability supply and workflow redesign: Single sterile insertion kit, standardised securement, and visual line-of-sight setup eliminated variation at the point of care.
- Embedded competency and rapid feedback loops: Quarterly competency validation; unit dashboards with weekly run/SPC updates; visual huddles for quick course correction.
- Advanced statistical surveillance for small volumes: Introduced CUSUM and EWMA to detect subtle shifts earlier than conventional run charts in low-event pediatric settings.
- Data-to-action governance: Any CAUTI triggers a 48-hour focused review with learning capture and immediate corrective actions.



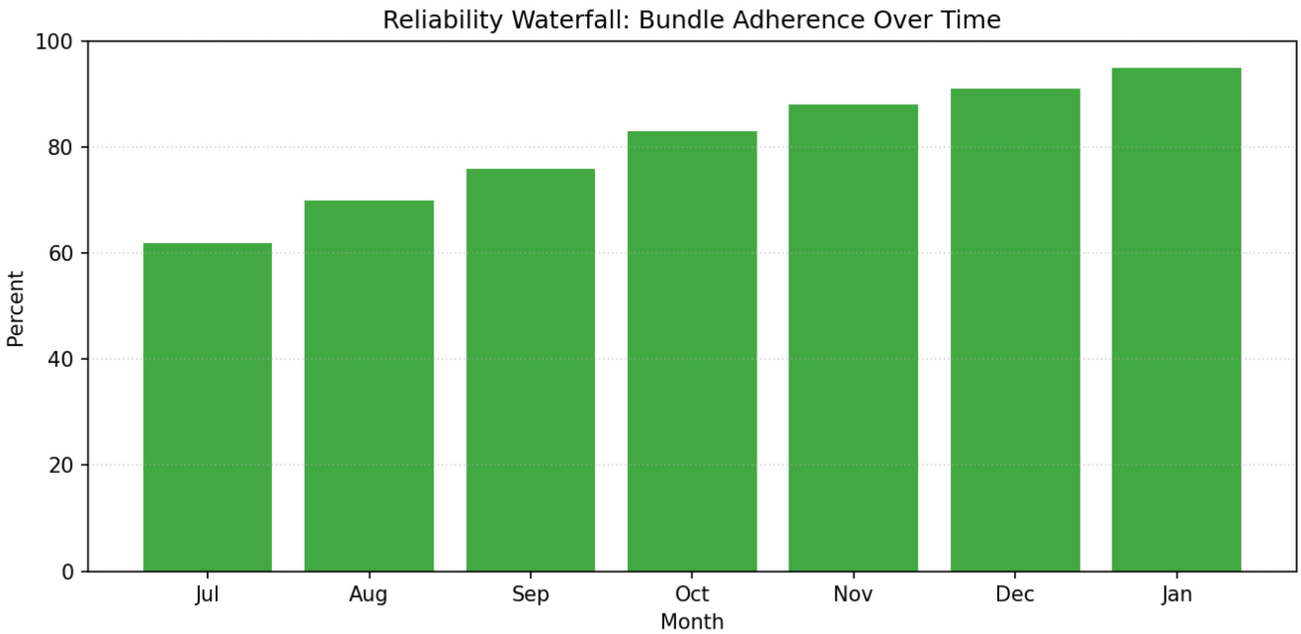
How we measured and visualised innovation:

- CUSUM (CAUTI vs target): Sensitive early warning to detect cumulative deviation from the target; falling trajectory indicates sustained improvement.
- EWMA (smoothed rate): Highlights gradual, meaningful change amid month-to-month noise; control limits adapt to volume.
- Reliability waterfall (bundle adherence): Shows stepwise gains from sequential PDSA cycles and hardwiring actions.
- Bundle element heatmap: Illuminates which bundle components needed focus over time, enabling targeted coaching and micro-PDSAs.
- Funnel plot (rate vs catheter-days): Distinguishes common-cause variation from true outliers considering monthly volume differences.



How the graphs informed action:

- CUSUM alerts prompted mid-cycle huddles and rapid retraining after a maintenance lapse alert.
- EWMA trend above mean triggered an asepsis refresher and kit relabelling; subsequent months trended down.
- Heatmap flagged meatal care and early removal as lagging; focused audits and nurse prompts closed the gap.
- Funnel plot confirmed months with zero CAUTI were within expected limits given exposure, supporting sustainment rather than overreaction.
- Reliability waterfall made progress visible to staff, reinforcing adherence through recognition.
- Practice/process changes enabled by these insights
- Daily device review standardised in bedside nurse workflow with EHR prompt and removal criteria.
- Urine culture panel defaults updated to indications-based orders with hard-stops for screening requests.



APPLICABILITY TO OTHER SETTINGS

The AJCH CAUTI reduction model is designed for portability across diverse care contexts by emphasising modular practices, data-driven governance, and human-factors-aligned workflows. The applicability heatmap shows consistently high adaptability for core components—indication policy, nurse-driven removal, insertion kit standardisation, maintenance audits, hand hygiene reinforcement, culture stewardship, and dashboards/SPC—across general paediatrics, PICU, surgical wards, adult med-surg, ED boarding, and regional hospitals. Variability is primarily operational (readiness, staffing patterns, and supply chain), not conceptual; thus, scale-up hinges on tailoring implementation supports rather than redesigning the model.

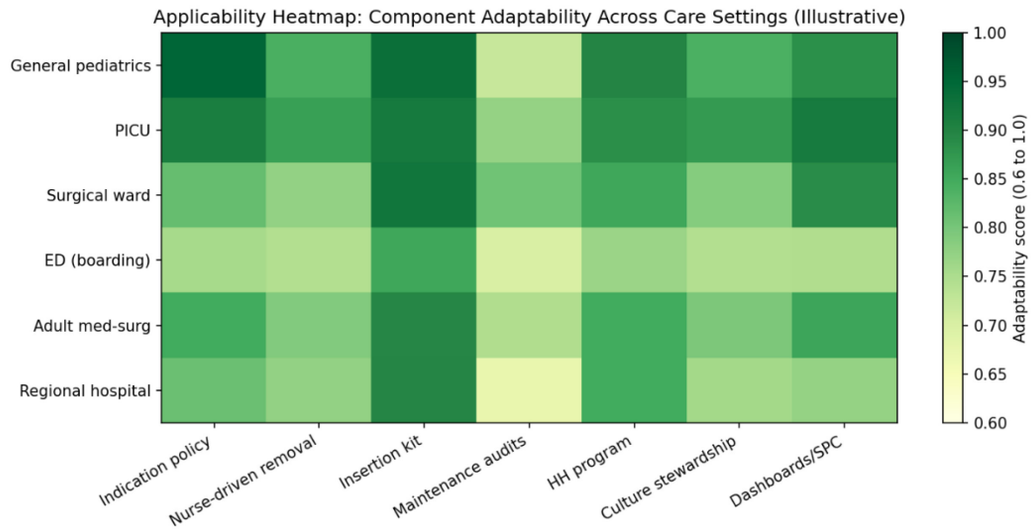
What transfers well

- Indication policy and nurse-driven early removal: These are universally relevant and quickly reduce device exposure, making them high-impact and low-complexity starts.
- Standardised insertion kits and visual aids: Reduces variation at the point of care across any inpatient environment; procurement alignment is the main lift.
- Maintenance audits and micro-checklists: Provide high-reliability cues that thrive in both high- and low-resource settings.
- Culture stewardship: Simple order-panel edits and reflex criteria prevent overtreatment and misclassification; benefits extend to antimicrobial stewardship programs.
- Dashboards and SPC: Scalable from simple run charts to u/p-charts; CUSUM/EWMA support small-volume services like paediatrics or low-utilisation adult units.

Contextual tailoring

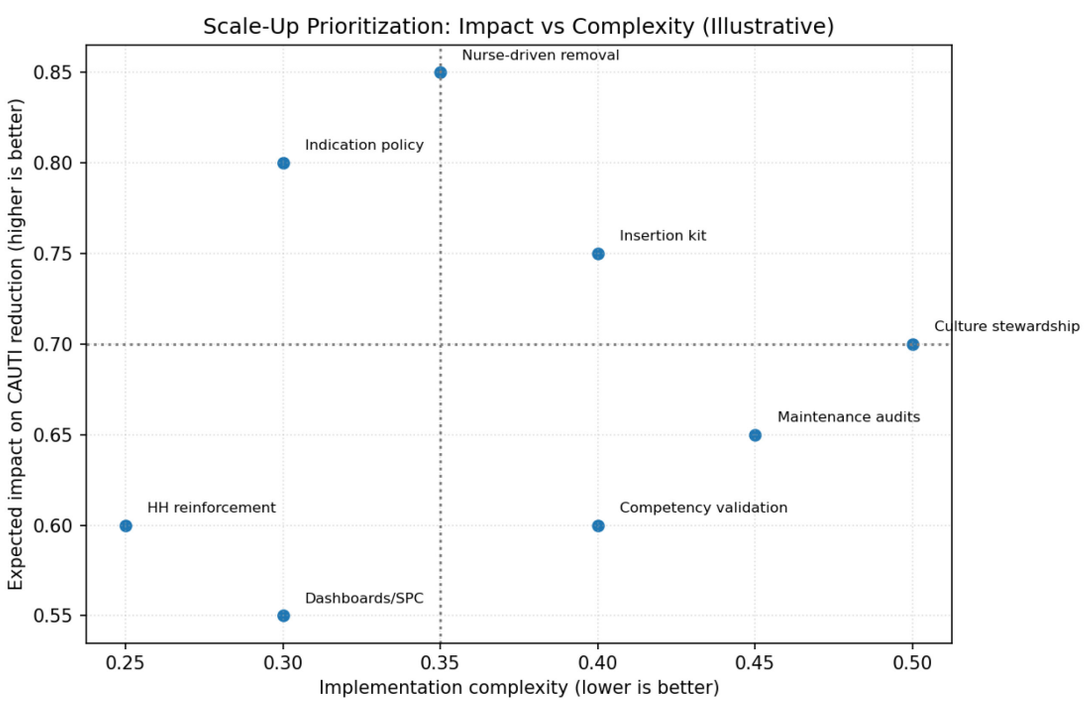
- PICU and surgical wards: Emphasise asepsis and intraoperative handoffs with CRNA/OR nurse alignment; add procedural champions for rapid cycle learning.
- ED boarding: Focus on indications and alternatives (bladder scan, timed voiding) to avoid unnecessary insertions during short stays; integrate prompts into triage and admission orders.
- Adult med-surg: Prioritise standard kits and removal protocols; align with sepsis bundles and mobility programs to prevent competing priorities.
- Regional hospitals: Start with a slim bundle (indication policy, nurse-driven removal, kit standardisation) and paper-based audits; evolve to EHR prompts and SPC as capacity grows.
- Implementation roadmap (90 days)
- Days 0–30: Adopt indication policy and nurse-driven removal; deploy standardised kits; launch weekly huddles with a simple run chart. Identify champions (IPC, nurse educator, unit lead).

- Days 31–60: Layer maintenance audits, point-of-care checklists, and culture stewardship order sets. Transition to u/p-charts; begin monthly learning reviews for any CAUTI.
- Days 61–90: Add dashboards, CUSUM/EWMA for low-volume units, and competency observation. Formalise governance with a short safety brief in leadership meetings.



Risk and mitigation

- Competing initiatives: Use a one-page driver diagram and merged audit tools to minimise perceived burden.
- Data capacity: Start with manual counts and basic run charts; upgrade to automated denominators later.
- Supply constraints: Create a low-cost kit alternative using existing sterile components; standardise labelling and instruction inserts.
- Expected benefits
- Rapid reduction in catheter-days, fewer CAUTIs, and decreased antibiotic exposure.
- Improved nurse autonomy and workflow reliability.
- Scalable stewardship benefits beyond CAUTI (e.g., urine testing appropriateness, antimicrobial days of therapy).



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APPENDIX

Appendix 1
Measure Specifications (Data Dictionary)
Operational definitions and calculation methods for outcome, process, and balancing measures used in this project.

Measure	Type	Definition	Numerator	Denominator	Unit / Reporting
CAUTI rate	Outcome	CDC/NHSN CAUTI in acute care	Number of CAUTI events (NHSN-defined) in month	Total catheter-days in month	Per 1,000 catheter-days; monthly u-chart
Catheter utilisation	Process	Device exposure	Catheter-days	Patient-days	Percent; monthly trend
Bundle adherence	Process	All-or-none bundle compliance	Number of fully compliant audits	Total audits performed	Percent; run/SPC as applicable

Hand hygiene compliance	Process	Moments 1–5 compliance	Observed compliant opportunities	Total observed opportunities	Percent; run/SPC
Urine culture appropriateness	Process	Cultures meeting indication criteria	Cultures with documented indication	Total urine cultures ordered	Percent; monthly trend
Balancing: Reinsertions within 48h	Balancing	Unintended removals leading to reinsertion	Number of reinsertions within 48h	Total removals	Percent; monthly trend

Appendix 2

CAUTI Bundle Checklist (Insertion and Maintenance)

Checklist used for competency validation and point-of-care audits. All elements must be present to count as adherent (all-or-none).

Domain	Element	Specification
Insertion	Indication documented	Meets approved indications; order + note
Insertion	Hand hygiene and PPE	HH immediately before aseptic insertion; gloves, gown as indicated
Insertion	Aseptic technique	Sterile field maintained; no breaks observed
Insertion	Appropriate catheter & securement	Size selection, securement device applied per standard
Maintenance	Closed drainage system	No breaks; sampling via port only
Maintenance	Daily CHG/meatal care	Per protocol, documented
Maintenance	Bag positioning	Below bladder; not touching floor
Maintenance	Daily necessity review	Nurse-driven removal criteria applied
Maintenance	Specimen stewardship	Culture only if indications present

Appendix 3
Governance and Responsibilities (RACI)
Roles and accountability for implementation, measurement, and sustainment.

Activity	IPC Lead	Nurse Manager	Unit Champions	Physician Lead	Data Analyst	Supply/Materials
Adopt indication policy	A	R	C	C	I	I
Nurse-driven removal workflow	C	A/R	R	I	I	I
Insertion kit standardisation	C	C	I	I	I	A/R
Maintenance audits & feedback	A	R	R	I	C	I
Urine culture stewardship	A	C	I	R	I	I
SPC dashboards (u, CUSUM, EWMA)	C	I	I	I	A/R	I
Learning reviews for events	A	R	R	C	C	I

Appendix 4
Data Collection and Analysis Methods
Roles and accountability for implementation, measurement, and sustainment.

Data sources:

- Denominators from bed management/EHR census; catheter-days from device flow sheets and audits.
- CAUTI events classified per CDC/NHSN criteria; case ascertainment via infection prevention reviews.
- Process measures from observation audits and EHR order logs; stewardship from order-panel metadata.

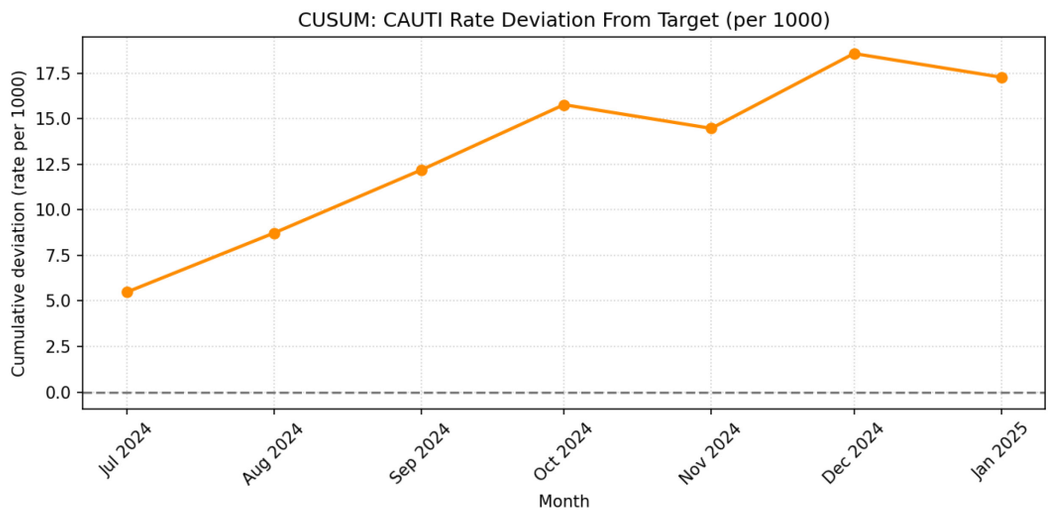
Analysis:

- Rates per 1,000 catheter-days; device utilisation as percent of patient-days.
- SPC: u-charts for event rates; run charts for compliance; CUSUM and EWMA for small-volume sensitivity.
- Funnel plot benchmarking by monthly volume using Poisson limits.

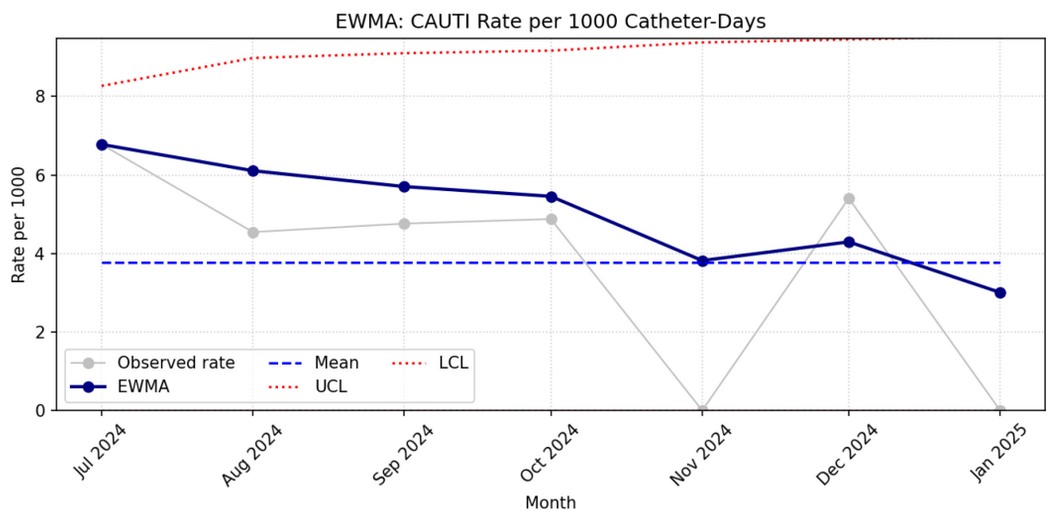
Frequency and governance:

- Weekly unit huddles review run/SPC; monthly QI council reviews signals per Western Electric rules.

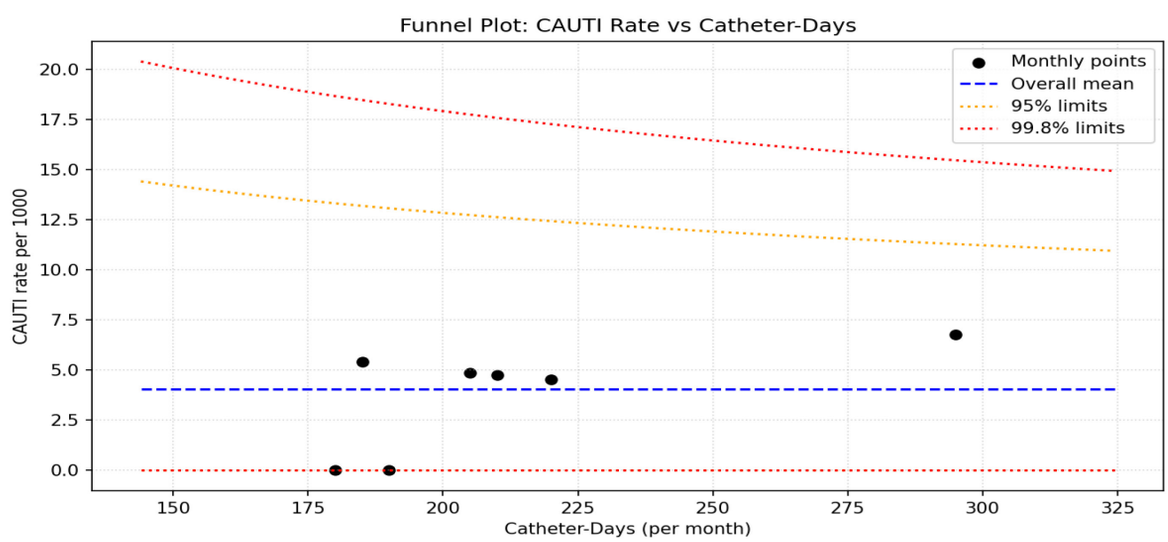
Appendix 5
Supplementary Figures
CUSUM: CAUTI Rate Deviation from Target



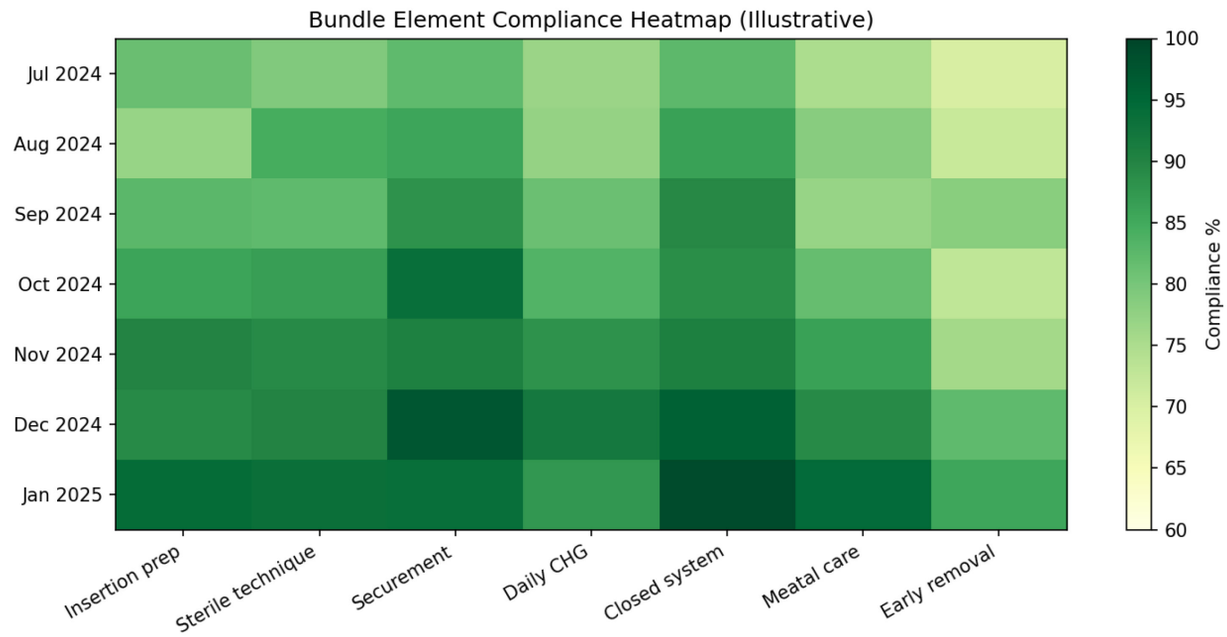
EWMA: CAUTI Rate per 1,000



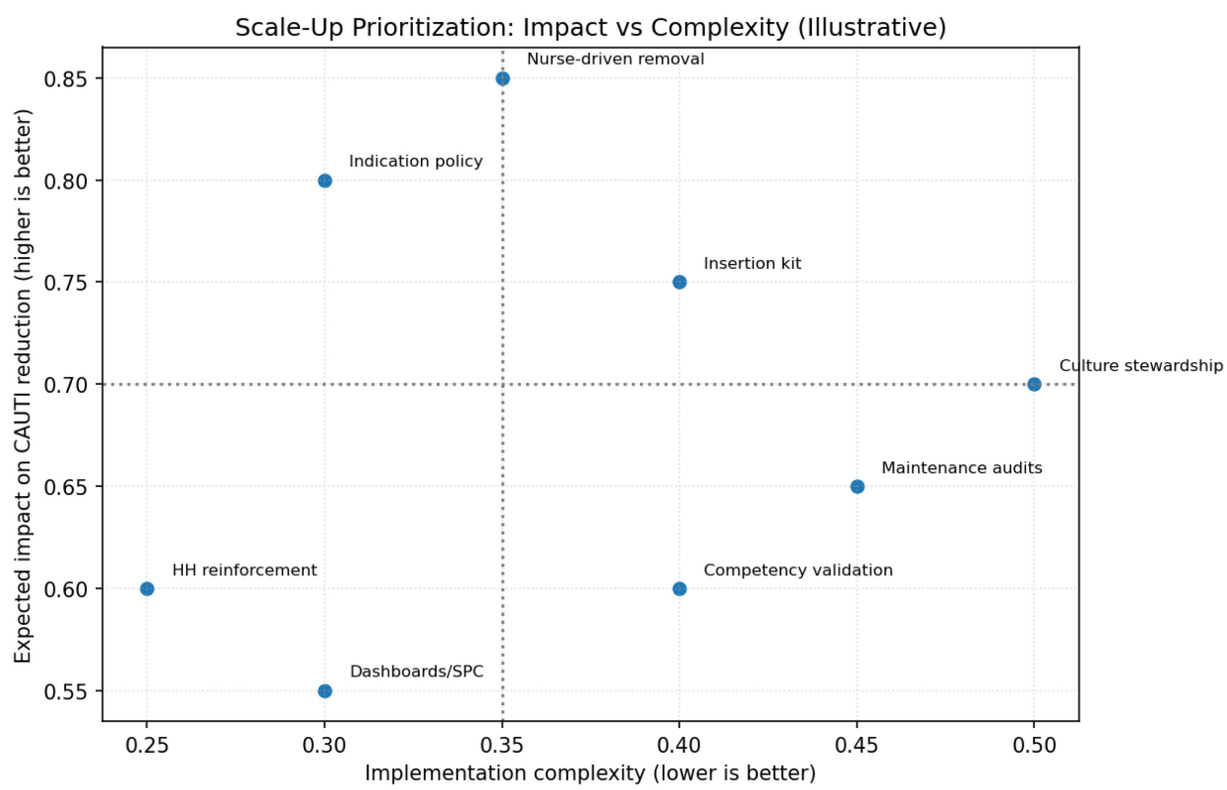
Funnel Plot: Rate vs Catheter-Days



Funnel Plot: Rate vs Catheter-Days



Scale-up Prioritisation: Impact vs Complexity



CLINICAL EXCELLENCE AND PATIENT SAFETY

TABLE OF SUBMISSIONS

Dubai Health, UNITED ARAB EMIRATES

Patient Safety and Quality Department

Zero by Design: Data-Driven CAUTI Prevention in a Paediatric Hospital at DUBAI HEALTH

Mr. Adli Baroud, Dr. Walid Abuhammour, Ms. Priya Padmanabhan, Dr. Deborah Westwood, Dr. Hesham Abdalla, Ms. Yuser Hamad, Mr. Adel Sharadgah, Ms. Samah Abdel Hamid Faeq Darwazeh, Mr. Jithin Raj Rajendran Pillai, Mr. Amal Vimalan, Dr. Mohammed Amber Khan and Dr. Entesar Abdulla Sultan Ali AlHammadi

Dubai Health, UNITED ARAB EMIRATES

Improving Reliability of Paediatric Early Warning Scores (PEWS) through Human-Centred Workflow Redesign: a Two-Cycle Clinical Audit of Practice Fidelity and Electronic Medical Record (EMR) Enabled Workflow at Al Jalila Children's Specialty Hospital, DUBAI HEALTH

Dr Mohammed Khan

Dubai Health, UNITED ARAB EMIRATES

Creating Drug Library, Integrating Smart Pump Technology, Electronic Medical Record (EMR) Alignment, and Multidisciplinary Collaboration to Achieve Zero Harm at DUBAI HEALTH

Dr Mohammed Khan

Dubai Health, UNITED ARAB EMIRATES

Optimising Antimicrobial Use in Paediatrics: A Two-Years Precision Initiative at DUBAI HEALTH

Dr Mohammed Khan

Emirates Group Medical Services, UNITED ARAB EMIRATES

Effective & Improved Management of Critical Alerts Using Quality tools - PDCA & FMEA

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From Delay to Delight: Reducing Admission Wait Times for Planned Surgeries through Ward-Led Clinical Engagement

Mr Charitha Wickramasinghe

Hemas Hospitals (pvt) ltd, SRI LANKA

Zero Missed Follow-Ups: A Sustainable Model to Strengthen HAI Surveillance

Mr Charitha Wickramasinghe

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5-WoW CARE: Point-of-Care Digitalisation in Hoan My Binh Phuoc Hospital (HMBP)

Mrs Linh Nguyen

Hoan My Cuu Long General Hospital, VIETNAM

The use of EMPATHIC-30 as a Satisfactory Measurement Tool in a Family-Centred Care (FCC) Paediatric Intensive Care Unit (PICU) in Malaysia

Mrs Diem NGUYEN

Hoan My Cuu Long General Hospital, VIETNAM

Care Quality Improvement: Outpatient Anticoagulant Therapy Management and Adherence Monitoring Model at Hoan My Cuu Long Hospital

Mr Bao Nguyen Van

Hoan My Sai Gon Hospital, VIETNAM

Report on the Effectiveness of Applying Double-Low (Low contrast and low kV) Computed Tomography Scan Techniques at Hoan My Sai Gon Hospital

Ms Trang Do

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Application of Fluorescent Marking to Enhance Environmental Surface Cleanliness Monitoring in Hospitals

Ms Hoan My Thu Duc

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Improving Preterm Infant Care through Early and Continuous Kangaroo Mother Care in Neonates ≥30 Weeks at Hung Vuong Hospital

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Hung Vuong Hospital, VIETNAM

Improving the Safety and Precision of Chemotherapy Prescribing through the Application of Health Information Technology

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Quality Improvement Program in the Prevention of Central Line Associated Bloodstream Infection in Neonates at Hung Vuong Hospital, Vietnam

Ms Anh Nguyen

Hung Vuong Hospital, VIETNAM

Improving the Quality of Early-Stage Breast Cancer Treatment through the Implementation of Breast-Conserving Surgery at Hung Vuong Hospital

Ms Anh Nguyen

Hung Vuong Hospital, VIETNAM

Enhancing the Quality of Care for Preterm Infants from 32 to 33 Weeks + 6 Days Gestation through Implementation of Kangaroo Mother Care (KMC) in the Postoperative Department

Ms Anh Nguyen

Hung Vuong Hospital, VIETNAM

Enhancing Postpartum Women's Participation in Physiotherapy at Outpatient Clinic A, Hung Vuong Hospital

Ms Anh Nguyen

Hung Vuong Hospital, VIETNAM

Improving the Rate of Pregnant Women with Hepatitis B Receiving Monitoring and Preventive Treatment for Mother-to-Child Transmission During Pregnancy at Outpatient Department B - Hung Vuong Hospital

Ms Anh Nguyen

Hung Vuong Hospital, VIETNAM

Platelet Concentration Technology Opens New Prospects in the Treatment of Thin Endometrium

Ms Anh Nguyen

Island Hospital Penang, MALAYSIA

Enhancing Medication Safety Through Batch and Expiry Verification

Ms Christine Kon

Matilda International Hospital, HONG KONG SAR

Matilda's Total Quality Management of Isolation Precautions

Mr Abbadon Abyss Vega Fegarido

Mouwasat Hospital, SAUDI ARABIA

Reducing Central Line Blood Stream Infection (CLABSI) Rates-PDCA

Dr Heraa Zarea

Mouwasat Hospital Dammam, SAUDI ARABIA

Activation of Online Hemodiafiltration (OlHDF) Service to Improve Patient Clinical Outcome

Mr Mohamed Almorshedi

Mouwasat Hospital Dammam, SAUDI ARABIA

Zero Harm Initiatives to Reduce the Hospital Acquired Pressure Ulcer Rate

Dr Doaa Elzanaty

NMC Royal Hospital, Khalifa City, UNITED ARAB EMIRATES

Reduction of Medical Device-Related Pressure Injury in Long Term Care Unit

Mr Jafar Badandi

Saudi German Hospital (SGH) Dammam, SAUDI ARABIA

Quality and Patient Safety Department

The Power of HSI: Advancing Patient Safety and Service Excellence Across the SGH Network

Dr. Eman Abu Koush, Dr. Sheren Kamel, Mr. Mumtaz Yousuf, Dr. Mohab Fawzy, Dr. Moustafa Hassoun, Dr. Dalia Abdalla, Dr. Bassant Abdelhady, Eng. Hajer Jrad, Dr. Hala Soliman, Dr. Hala Soliman, Dr. Eman Ragab and Dr. Mohammed Hussein

St Paul's Hospital, HONG KONG SAR

Implementing a '3-in-1 Baby Tagging System' Ensuring Safety for the Vulnerable Group in St Paul's Hospital

Ms Yuk Yu Alice Cheng

St Paul's Hospital, HONG KONG SAR

The CLEAN HANDS Initiative: A Multi-Modal, Sustained Program for Cultural Transformation in Hand Hygiene

Ms Woon Yee Christina Cheung

Thuan My TDM Hospital, VIETNAM

Improving Obstetric Safety at Thuan My TDM Hospital in 2025 Based on WHO Recommendations

Dr Trang Truong

Todua Hospital, GEORGIA

Integration of International Oncology Protocols into the Electronic Medical Record (EMR) for Safer Chemotherapy Delivery

Mr Irakli Poladashvili

SUSTAINABLE HEALTHCARE AND SERVICE DELIVERY

WINNER

Sunway Medical Centre, MALAYSIA

Operations Department

Sustainable Healthcare: Integrating Innovation, Care, and Environmental Responsibility

Mr Leong Ming Chung, Ms Kalliamah Sanjeevi and Ms Nur Shalinie Binti Ridzuan

AIM

Our aim is to integrate sustainability into every dimension of healthcare delivery at Sunway Medical Centre by systematically reducing our environmental footprint, optimising resource utilisation, and embedding a culture of responsible practice. Specifically, we target measurable reductions in energy consumption, clinical and non-clinical waste, and single-use resource dependency, while maintaining excellence in patient safety and care outcomes. Through innovative initiatives in renewable energy, circular waste management, and patient-centred sustainability programs, we strive not only to create a healthier environment for our patients, staff, and community, but also to establish a replicable benchmark for sustainable healthcare in Malaysia and the wider region.

SUMMARY ABSTRACT

Background:
Sunway Medical Centre (SMC), located within Sunway City—the nation's first integrated sustainable city—has embraced a pioneering role in redefining what it means to deliver world-class healthcare responsibly. Recognising that hospitals are traditionally resource-intensive and contribute significantly to carbon emissions and waste, SMC has committed to embedding sustainability into the heart of clinical, operational, and infrastructural practices. Our vision is clear: to protect patient health today while safeguarding planetary health for generations to come.

This commitment is deeply aligned with our parent organisation, Sunway Healthcare Group (SHG), which in 2024 was recognised as Company of the Year (Healthcare) for Community Care and Sustainability at the Sustainability & CSR Malaysia Awards. Strengthening our global leadership position, SMC became the first hospital in Malaysia to join the Race to Zero campaign, pledging net-zero carbon emissions by 2050 in alignment with the Paris Agreement.

Driving measurable environmental impact:
In 2024, our sustainability programs achieved transformative results across multiple domains:

- Renewable Energy Leadership: Expansion of our rooftop solar infrastructure enabled the generation of clean power that avoided 410.73 tonnes of CO_2e emissions, a 16.5% increase over 2023. This was achieved through targeted investments in advanced solar technology, improved energy management systems, and collaborative partnerships. Beyond numbers, this initiative reduces dependence on fossil fuels, stabilises long-term energy costs, and demonstrates renewable energy's viability within a tertiary hospital setting.
- Circular Economy in Healthcare Waste: In partnership with Cenviro, SMC signed a landmark MoU to recycle and repurpose Schedule Waste 409—a category of non-infectious, non-sharp medical items such as gowns, caps, syringes without needles, and plastic containers. Traditionally incinerated or landfilled, these materials are now redirected into recycling streams, transforming waste into value and setting a new standard for clinical waste management in Malaysia.
- Waste Diversion at Scale: Through our comprehensive Waste Diversion Program, supported by robust staff education and strict segregation protocols, SMC successfully redirected 137 tonnes of waste away from landfills in 2024. This represents a 60% improvement compared to 2023, reflecting not just process

efficiency, but the success of a hospital-wide cultural shift towards accountability and environmental stewardship.

The success of these programs highlights the importance of adopting a circular economic approach, viewing waste as a valuable resource rather than discard. Moving forward, we aim to expand these efforts by exploring innovative waste reduction technologies and engaging stakeholders in continuous sustainability education.

Embedding sustainability into governance and infrastructure:
Sustainability is not treated as a project, but as an organisational DNA. Our hospital infrastructure incorporates green building principles aligned with the Global Green and Healthy Hospitals (GGHH) framework. To institutionalise governance and ensure continuous improvement, we are pursuing ISO 14001 Environmental Management System (EMS) certification, targeted for completion by May 2026. This step ensures alignment with global standards and embeds sustainability into policy, operations, and future planning.

Creating impact beyond the hospital:
What makes SMC's sustainability journey distinctive is its transferability. Our programs are designed not only to deliver measurable outcomes for our hospital, but to inspire replication across the healthcare sector in Malaysia and the wider Asia-Pacific region. Through partnerships, staff engagement, and patient-centred initiatives, we are demonstrating that healthcare can be both environmentally responsible and economically viable—without compromising clinical quality or patient safety.

Conclusion:
Sunway Medical Centre is proving that sustainability and healthcare excellence are mutually reinforcing. Our achievements in renewable energy, waste reduction, and governance demonstrate that large-scale hospitals can reduce their environmental footprint while delivering safe, high-quality, patient-centred care. By sharing our learnings and continuously innovating, SMC aims to set a benchmark for sustainable healthcare delivery—showcasing how hospitals can become active contributors to global climate solutions while promoting healthier communities and a healthier planet.

REPORT

APPLICATION OF ACHSI PRINCIPLES

1. Consumer Focus
At Sunway Medical Centre (SMC), we place consumers at the heart of sustainable healthcare. Patients and families are actively engaged through satisfaction surveys, consumer advisory groups, and open communication channels, ensuring services are responsive and co-designed with the community.

To extend this partnership, we introduced Sustainability Week, an annual event that empowers patients, staff, and the wider community to take ownership of environmental stewardship. Activities include green health campaigns, eco-friendly workshops, interactive exhibitions, and cross-generational learning sessions that encourage everyday sustainable practices in healthcare.

By aligning with the United Nations Sustainable Development Goals (UNSDGs), this initiative elevates our consumers from passive recipients of care to active contributors to planetary health. Feedback indicates that Sustainability Week not only raises awareness but also inspires behavioural change, reinforcing our belief that high-quality healthcare and environmental responsibility are inseparable.

2. Effective Leadership
SMC's sustainability journey is driven by visionary leadership at the highest levels. The Chairman of Sunway Berhad and the Managing Director of Sunway Healthcare Group (SHG) have personally championed sustainability as a strategic priority, embedding it into healthcare delivery, infrastructure, and culture.

This commitment is operationalised through a dedicated Sustainability Committee comprising multidisciplinary

representatives from across the hospital. The committee drives strategy, monitors progress, and ensures alignment with the UNSDGs, supported by leadership development programs and transparent governance frameworks.

Our leaders model accountability by integrating sustainability goals into performance reviews, operational planning, and community engagement. This top-down and bottom-up approach ensures that sustainability is not an initiative but a core organisational value, shaping daily practices while reinforcing our commitment to quality, safety, and social responsibility.

3. Continuous Improvement

In 2019, prior to the COVID-19 pandemic, our hospital began laying the foundation for sustainable healthcare operations. At that time, our sustainability drive was in its early stages, with a primary focus on waste management, implementing structured segregation, recycling initiatives, and basic environmental awareness across departments.

The global pandemic that followed presented unprecedented challenges, but also highlighted the critical importance of building resilient and resource-efficient systems. Post-pandemic, our sustainability efforts evolved and expanded into energy efficiency and renewable energy initiatives. Key milestones included the adoption of solar energy, LED lighting upgrades, and the optimization of cooling tower energy performance, all aimed at reducing our environmental footprint while improving cost-efficiency.

Recognising that lasting change requires collaboration, the hospital has since established a Sustainability Committee, comprising representatives from various departments. This multidisciplinary team plays a central role in embedding sustainable practices into day-to-day operations, coordinating hospital-wide initiatives, and fostering a culture of shared environmental responsibility.

Our journey from basic waste management to integrated sustainability reflects our commitment to long-term environmental stewardship and aligns with the broader goals of sustainable healthcare transformation.

4. Evidence of Outcomes

SMC's sustainability initiatives are grounded in measurable outcomes and transparent reporting. Key achievements include:

- 248 tonnes of waste diverted from landfill over the past five years through structured recycling and reduction programs.
- 137 tonnes of waste successfully redirected in 2024 alone, a 60% improvement over 2023.
- 410.73 tonnes of CO_2 emissions avoided in 2024 through solar energy generation, representing a 16.5% year-on-year increase.

These results are validated against benchmarks and reported internally and externally to ensure accountability. Beyond the statistics, staff engagement surveys and patient feedback confirm growing awareness and pride in SMC's sustainability leadership. Collectively, these outcomes demonstrate that quality healthcare delivery and environmental responsibility can coexist as mutually reinforcing goals.

5. Striving for Best Practice

SMC is committed to exceeding standards by benchmarking our sustainability efforts against national and international frameworks. We align our work with the Global Green and Healthy Hospitals (GGHH) framework, actively contribute to the Race to Zero initiative, and are on track to achieve ISO 14001 Environmental Management System certification by 2026.

Best practices are integrated into clinical protocols, operational policies, and infrastructure development. Staff are supported through continuous education, sustainability training, and access to evidence-based resources that foster innovation.

By positioning ourselves as the first Malaysian hospital to join the Race to Zero, SMC is not only striving for best practice—it is setting new benchmarks for the healthcare sector in Malaysia and the wider Asia-Pacific region, proving that sustainable healthcare is achievable, replicable, and essential.

INNOVATION IN PRACTICE AND PROCESS

Green Infrastructure and Energy Systems

- Optimise Energy Usage
  In terms of sustainability and environmental innovation, we have made substantial investments in green infrastructure and practices. These include the installation of solar panels to reduce reliance on fossil fuels, the use of energy-efficient lighting systems, and the implementation of a hospital-wide water recycling initiative. We have also optimised the performance of our cooling towers, a critical component of hospital energy use, by introducing measures such as variable frequency drives (VFDs), improved water treatment systems, and automated controls that adjust cooling load based on real-time demand. These enhancements significantly reduce electricity and water consumption while maintaining optimal indoor climate conditions. Collectively, these efforts have not only reduced our environmental footprint but also generated long-term cost savings. Our commitment to environmentally sustainable healthcare has been recognised through our achievements in areas such as renewable energy adoption, waste management, and energy-efficient infrastructure.

- LED Smart Lighting in Emergency Staircases
  We have replaced conventional lighting in emergency staircases with LED smart lighting systems that are motion-activated and energy-efficient. Unlike traditional bulbs, LEDs consume significantly less electricity and have a longer lifespan, reducing maintenance frequency and costs. The smart lighting only activates when movement is detected, ensuring safety while minimising unnecessary energy consumption during low-traffic periods. This not only enhances operational efficiency but also contributes to reduced carbon emissions, aligning with our commitment to energy conservation program.

- Targeted HVAC Shutdowns in Low-Use Areas
  Heating, Ventilation, and Air Conditioning (HVAC) systems are among the most energy-intensive components in any healthcare facility. Using building automation systems and occupancy-based controls, we strategically reduce or shut down HVAC operations in non-critical or unoccupied areas—such as administrative offices after hours, storage spaces, and intermittently used meeting rooms.
  This targeted approach not only lowers energy consumption and operational costs but also contributes significantly to reducing our Building Energy Intensity (BEI)—a key performance indicator that measures energy use per square meter. By optimising HVAC usage, we improve our BEI rating, demonstrating measurable progress toward energy efficiency goals. Additionally, this contributes to reduced greenhouse gas emissions, prolonged equipment lifespan, and enhanced environmental sustainability without compromising patient comfort or clinical safety.

Water and Waste Innovations

- Rainwater Harvesting Systems
  Our rainwater harvesting infrastructure collects and stores rainwater for non-potable uses such as landscape irrigation, toilet flushing, and general cleaning. By reducing reliance on treated potable water, we conserve valuable drinking water resources and decrease the load on municipal water systems. This initiative also supports environmental sustainability by lowering water utility costs and mitigating the risk of stormwater runoff, which can contribute to local flooding and pollution.

- Sensor-Activated Faucets
  Installed across our facilities, sensor-activated faucets help reduce water wastage by delivering water only when needed. Traditional taps can often be left running accidentally, especially in high-use areas like public restrooms or clinical zones. By using infrared sensors to detect hand movement, these faucets ensure water flows only during active use. This not only saves water but also supports hygiene standards, as they reduce the need for hand contact—an important consideration in infection control.

- Food Waste Composting Programs
  We have implemented on-site composting systems to manage food waste generated by hospital kitchens and cafeterias. Rather than sending organic waste to landfills, where it would produce methane, which is

a potent element in greenhouse gas, and converted into compost. This compost is then used in landscaping or shared with our local landscape vendor, supporting circular waste practices. The program demonstrates our commitment to reducing landfill dependency while promoting responsible.

These efforts showcase a holistic approach to waste—viewing it as a resource rather than a burden.

Clinical and Patient-Centred Innovation

Patient-centred innovation is a vital component of our sustainability strategy. By actively involving consumers in the co-design of healthcare services—through advisory committees and patient feedback mechanisms—we ensure that our care models are inclusive, culturally sensitive, and accessible to diverse populations. This approach strengthens social sustainability by promoting health equity and community well-being, while also driving economic sustainability through system efficiencies such as reduced appointment no-shows enabled by digital scheduling tools. To further support patient engagement and health outcomes, we have implemented multilingual health education materials that foster improved communication, adherence, and trust. These initiatives not only improve individual care experiences but also contribute to reduced strain on healthcare resources.

Our commitment to sustainability also extends to clinical innovation. The implementation of Electronic Medical Records (EMRs) has significantly reduced paper use and streamlined clinical workflows, enhancing both environmental and operational outcomes. The introduction of anaesthetic gas capture and recycling systems minimises the environmental impact of surgical procedures, aligning clinical practices with ecological responsibility. Additionally, the expansion of telemedicine services has reduced the need for patient travel, lowering both carbon emissions and barriers to accessing care.

Community and Transportation Innovation

To support the transition to greener transportation, EV charging stations have been installed in hospital car parks. This initiative encourages patients and visitors to adopt electric vehicles by providing convenient and accessible charging options. As transportation is a major contributor to greenhouse gas emissions, enabling cleaner commuting choices aligns with our sustainability targets and contributes to a reduction in our overall environmental footprint.

Community and Transportation Innovation

What makes SMC's approach unique is the integration of environmental, clinical, and consumer-focused practices into a single sustainability framework. Instead of isolated projects, our initiatives form a comprehensive, interconnected system.

SMC's sustainability initiatives are grounded in measurable outcomes and transparent reporting. Key achievements include:

- Energy innovation reduces operating costs and carbon emissions.
- Waste diversion fosters a circular economy.
- Clinical innovations safeguard planetary health while advancing patient outcomes.
- Community initiatives empower consumers to be co-creators of sustainability.

This systems-level innovation demonstrates how healthcare institutions can achieve the triple bottom line of environmental stewardship, economic efficiency, and social responsibility. By embedding these practices into core operations, SMC is setting new benchmarks for sustainable healthcare in Malaysia and the region, offering a replicable model for others to adopt and scale

APPLICABILITY TO OTHER SETTINGS

The innovative practices and processes we have implemented are not only beneficial within our own organisation but are also highly transferable and adaptable to other healthcare settings. Whether in urban tertiary hospitals, regional health centers, or smaller community-based facilities, the core principles behind our innovations—efficiency, sustainability, patient-centred care, and continuous improvement—can be effectively applied and scaled to meet local needs and capacities.

Our experience with process improvement using Lean methodologies can be applied across all healthcare settings. The principles of identifying waste, enhancing workflow efficiency, and improving value for patients are universal. Clinics, day surgery units, and residential aged care services can all benefit from adopting a culture of continuous quality improvement. By empowering frontline staff to identify problems and test solutions in small cycles, improvements can be made without the need for major investment.

The sustainability initiatives we have undertaken, such as solar energy adoption and waste reduction programs, can also be scaled and replicated. These practices are increasingly relevant in all healthcare environments, given the global focus on climate resilience and cost efficiency. Facilities with limited capital can still begin with smaller interventions, such as switching to LED lighting, improving waste segregation practices, or engaging staff in green teams to lead sustainability efforts from the ground up.

For healthcare facilities with limited financial or infrastructural resources, smaller-scale interventions can be powerful starting points:

Switching to LED Lighting:
Replacing conventional lighting with energy-efficient LED bulbs reduces electricity consumption and maintenance costs, delivering immediate and measurable savings.

Improved Waste Segregation:
Even simple steps such as clearly labelling bins, educating staff on waste types, and conducting regular monitoring can greatly improve waste diversion rates and safety.

Engaging Staff through Green Teams:
Empowering employees by creating sustainability committees or "green teams" fosters a culture of environmental responsibility. These teams can champion projects like energy-saving challenges, waste reduction drives, or awareness campaigns, generating grassroots momentum for sustainable practices

In terms of consumer engagement and co-design, our model of involving patients and families in shaping care processes is applicable to any setting. Whether in large hospitals or primary care centers, mechanisms such as consumer advisory boards, feedback surveys, and co-designed patient information materials can foster more responsive and person-centred care.

In conclusion, the innovations we have implemented are not only impactful in our own context but also offer a roadmap for other healthcare organisations aiming to improve quality, sustainability, and patient outcomes. With thoughtful adaptation and stakeholder engagement, these practices can contribute to broader system improvements across the healthcare sector.

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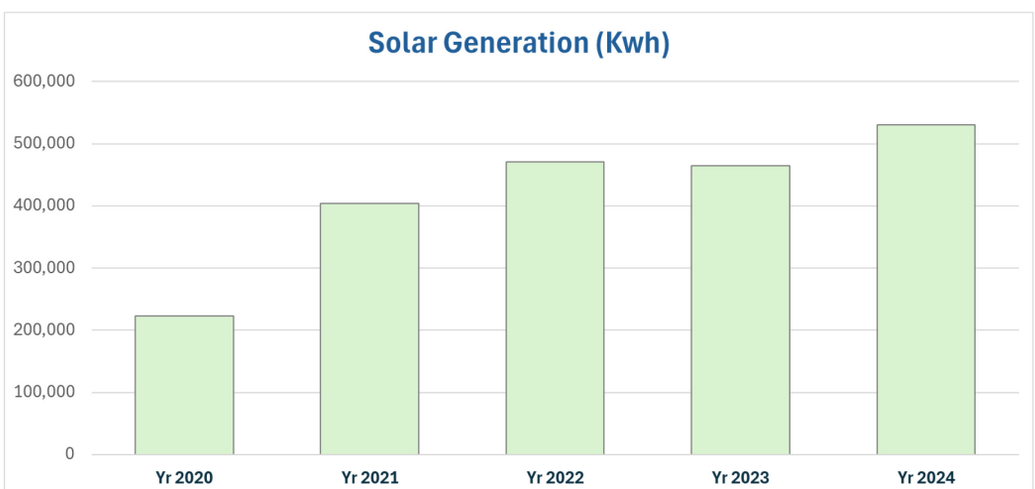
APPENDIX

Solar

Through the use of renewable energy generated by our rooftop solar panels, we avoided 410.73 tonnes of CO_2e emissions in 2024. This represents a significant step forward compared to the 352.47 tonnes avoided in 2023, reflecting a 16.5% year-on-year improvement. The increase demonstrates the growing impact of our solar infrastructure and highlights the important role renewable energy continues to play in reducing our carbon footprint.



Overall Growth Impact (2020-2024)

Solar Generation Growth (2020-2024)

Between 2020 and 2024, solar energy generation increased by over 140%, rising from approximately 220,000 kWh to more than 520,000 kWh. The most significant jump occurred between 2020 and 2021, where output doubled, reflecting a major expansion in solar capacity. While growth stabilised slightly in 2023, another increase was recorded in 2024, indicating continued investment in renewable energy.

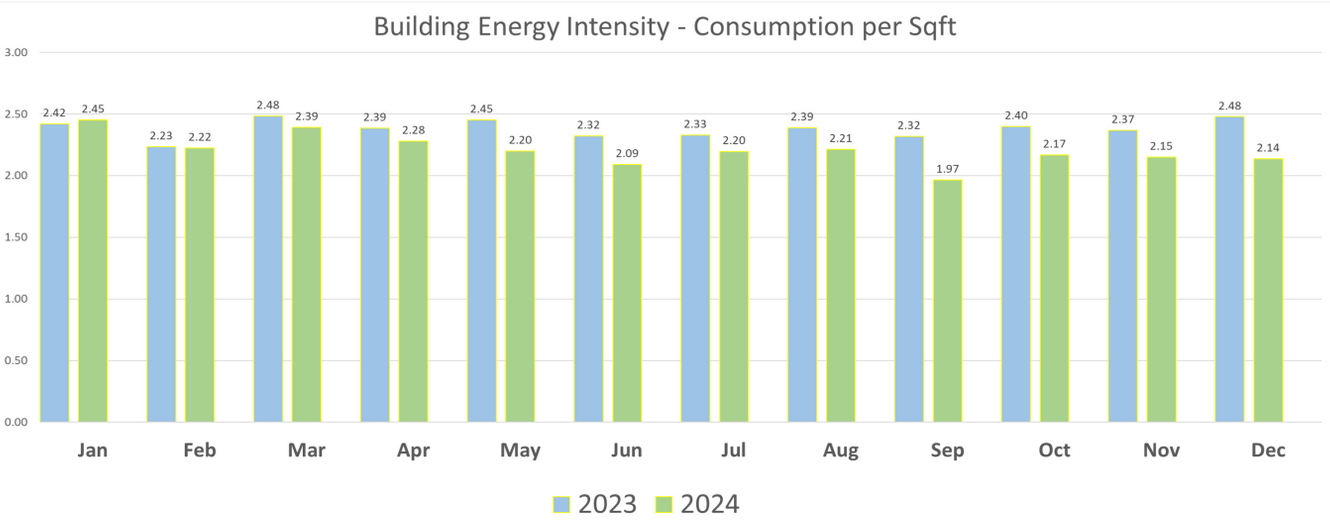
This upward trajectory demonstrates our commitment to sustainability and supports the United Nations Sustainable Development Goals (UNSDGs), particularly Goal 7 (Affordable and Clean Energy) and Goal 13 (Climate Action). The ongoing expansion of solar initiatives is a key component of our broader environmental strategy under the leadership of Sunway Berhad and Sunway Healthcare Group (SHG).

Building energy intensity

In 2024, our building demonstrated a consistent reduction in energy consumption per square foot compared to 2023, reflecting significant strides in operational efficiency and sustainability. Energy intensity decreased every month, with the most substantial improvement observed in September. This consistent downward trend highlights our ongoing commitment to energy conservation and supports our eligibility for the Sustainability initiative.

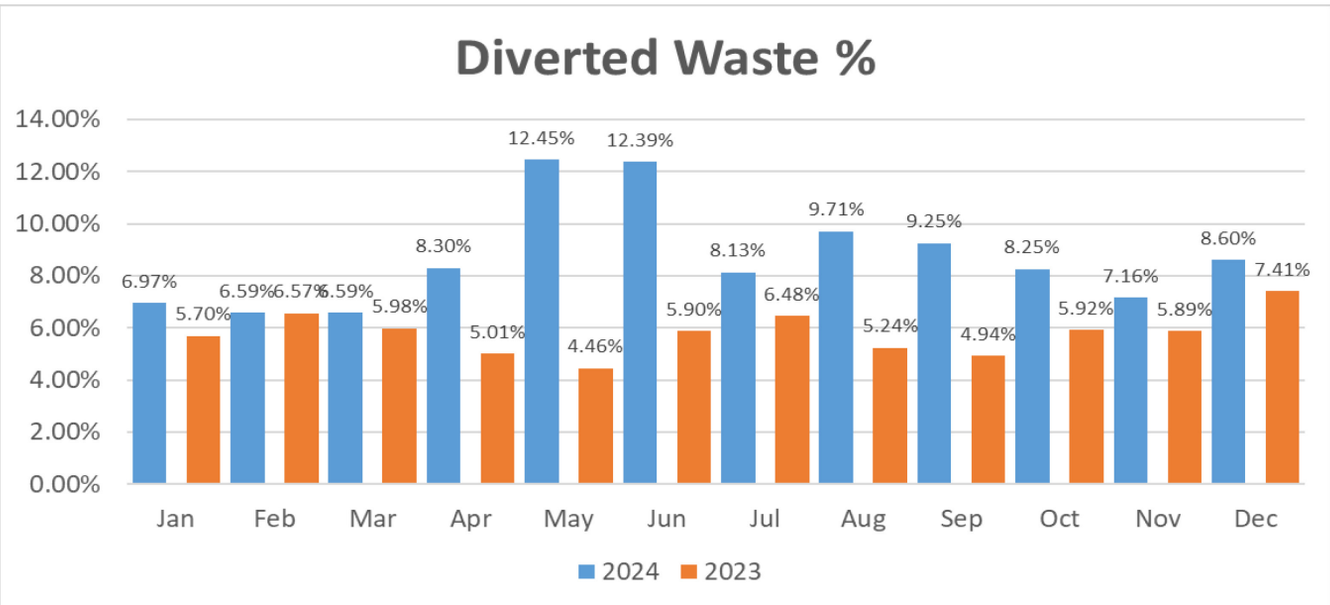
Year-to-Year Efficiency

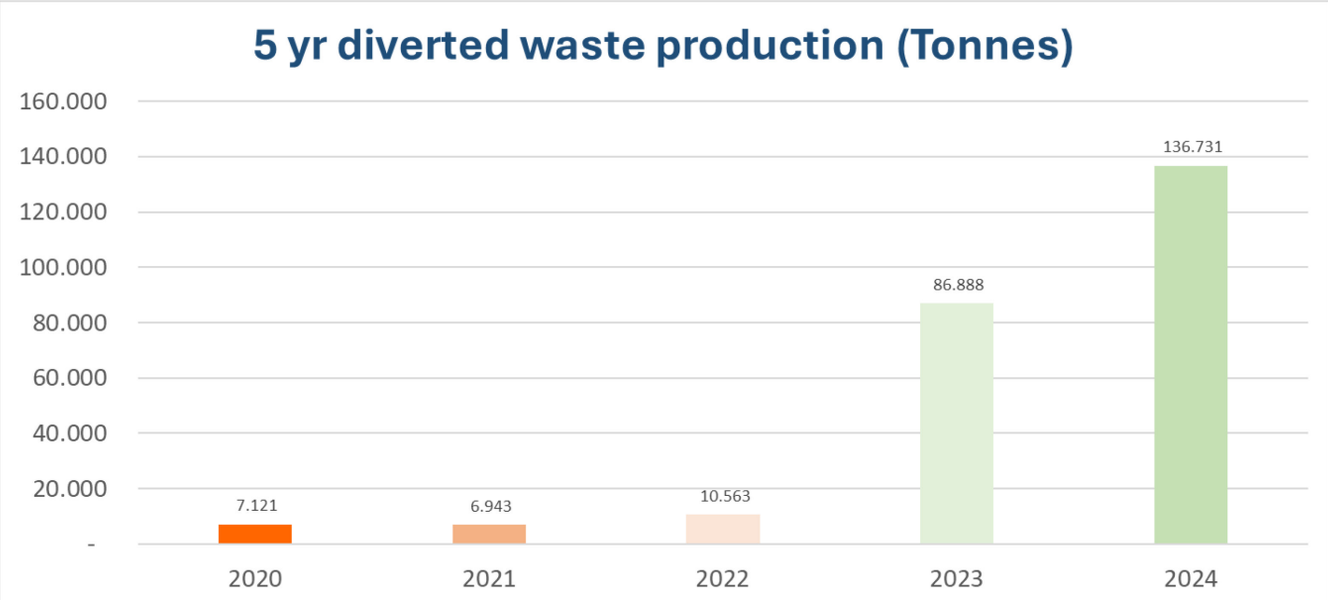
Each month shows a decrease in energy consumption per sqft in 2024 compared to 2023, indicating successful energy-saving measures or operational efficiencies.



Waste management

Waste Diversion Program - segregation, recycling, and repurposing of both medical and non-medical materials. In 2024, SMC has successfully redirected over 137 tonnes of waste from landfill, a 60% increase compared to 2023





The diverted waste percentage improved notably in 2024 compared to 2023, demonstrating strengthened waste management efforts. Monthly waste diversion rates in 2024 consistently exceeded those of 2023, with significant peaks in May and June reaching approximately 12.5%, nearly double the diversion rates seen in the same months of 2023.

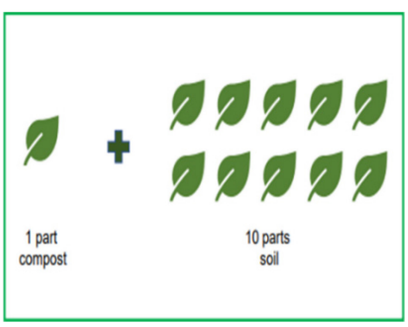
Early and late months also showed steady improvement, with December 2024 reaching close to 9% diversion compared to around 7% the previous year. The increased diversion reflects enhanced recycling, reuse, and waste reduction initiatives, supporting our commitment to environmental sustainability and aligning with UN Sustainable Development Goal 12: Responsible Consumption and Production.

Clinical waste (schedule waste 409)
In Q3 2024, Sunway Healthcare Group signed an MoU with our waste management vendor to explore the recycling of clinical waste (SW409) — a first-of-its-kind initiative within the Group. This marks a major step forward in our sustainability efforts, moving beyond compliance to embrace waste recovery and circular practices. For Sunway Medical Centre, it reflects our ongoing commitment to environmental innovation and continuous improvement.

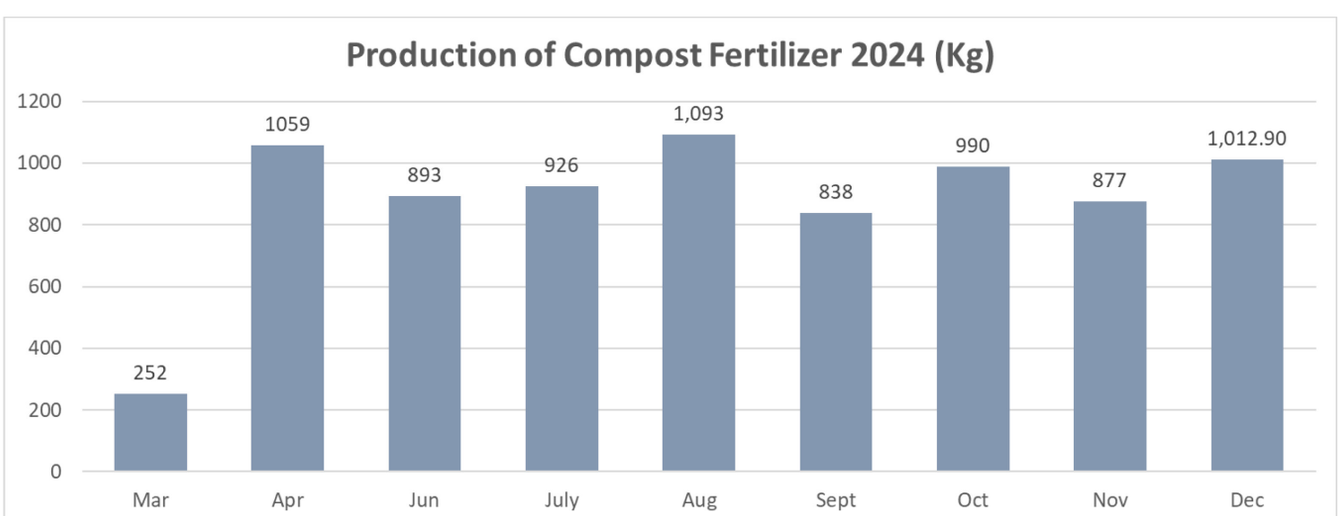
Bioenzymes

In-house Bio Enzyme production: Bioenzymes, several applications in hospitals for cleaning, odour control. They are used to break down organic matter, sanitise surfaces and for Kitchen cleaning.

SMC has launched a food composting initiative, transforming food waste into fertilizer and collaborating with local farmers and landscape vendors to support sustainable agriculture and landscaping. Supporting the United Nations Sustainable Development Goal 13 on Climate Action by reducing landfill waste and promoting sustainable practices.



Since March 2024, Food composting has generated 9 tonnes of Compost data, another continuous improvement and practices initiated. The production of composting was given to our local landscape vendor and our Sunway Xfarm, which produces fresh and pesticide-free produce.



Electric Vehicle (EV) Charging Installation at Sunway Medical Centre: A Step Toward Sustainability
Sunway Medical Centre's installation of eight electric vehicle (EV) charging bays across its campus aligns with Sunway Group's broader sustainability and smart city initiatives. By partnering with operators like ParkEasy and JomCharge, the medical centre supports the adoption of low-carbon transportation among patients, staff, and visitors.

These charging stations—located in Towers A, E, and F, offering up to 20 kW AC output—promote the shift from fossil fuel vehicles to cleaner electric alternatives. This move helps reduce greenhouse gas emissions, supports urban decarbonization, and integrates with Sunway City's vision of becoming a low-carbon, climate-resilient city.

Furthermore, by embedding this infrastructure in a high-traffic healthcare facility, Sunway demonstrates a practical and forward-thinking approach to sustainability, making it easier for people to choose eco-friendly transportation without compromising convenience.

This initiative complements Sunway's commitments under frameworks like the UN Sustainable Development Goals (SDGs), particularly:

SDG 11: Sustainable Cities and Communities
SDG 13: Climate Action

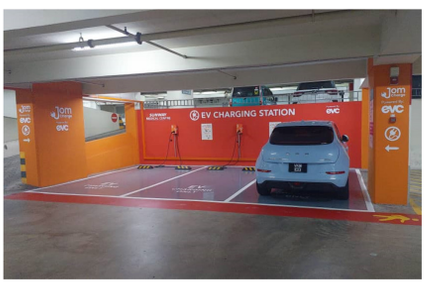
Why It Matters
Convenience for EV Drivers: With multiple fast-charging options (11 kW and 20 kW) strategically placed across different towers, charging is available while attending appointments or visiting the hospital.

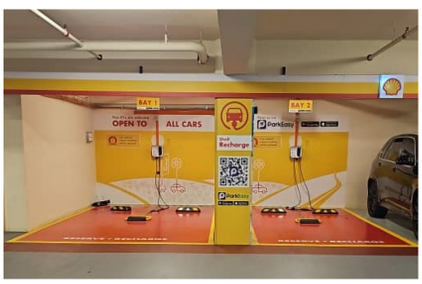
Technology & Sustainability: This infrastructure reflects Sunway's commitment to sustainable development and smart city integration within its medical and residential facilities.

User-Friendly Access: Requiring app-based activation ensures users can easily locate and operate the chargers, although it does mean each app must be installed in advance.

Quick Summary Table:

Location	Operator	Output	Number of Bays
Ground Floor, Tower A	ParkEasy	AC 11 kW	2
Level P1, Tower E	JomCharge	AC 20 kW	3
Level P1A, Tower F	JomCharge	AC 20 kW	3





SUSTAINABLE HEALTHCARE AND SERVICE DELIVERY

HIGHLY COMMENDED

Todua Clinic, GEORGIA

IT Department

Artificial Intelligence for Sustainable and Patient-Centred Service Delivery at Todua Clinic

Mr Irakli Poladashvili, Mr Anri Chkhaidze, Mr Lasha Sharvadze and Ms Sophio Gognadze

AIM

The aim of this project was to fundamentally transform the sustainability and efficiency of administrative and patient-facing services at Todua Clinic through the systematic application of artificial intelligence (AI). The primary objectives were to reduce the risk of human error in registration and insurance processes, shorten patient waiting times, eliminate paper-based documentation, and establish a digital-first model of healthcare service delivery. By automating data extraction, form completion, biometric authorisation, and queue management, the system was designed to improve patient satisfaction, reduce environmental impact, and free staff capacity for direct care. The initiative also sought to position Todua Clinic as a pioneer of sustainable healthcare innovation in Georgia, with the long-term goal of providing a replicable model for other facilities nationally and internationally. In doing so, the project delivered not only operational efficiency but also measurable ecological and financial benefits.

SUMMARY ABSTRACT

Introduction:
In December 2024, Todua Clinic became the first healthcare institution in Georgia to implement artificial intelligence (AI) across its administrative services, establishing a model of sustainable, efficient, and patient-centred service delivery. The project was initiated in response to three critical challenges: excessive reliance on manual, paper-based systems; long waiting times for patients; and high rates of administrative error in registration and insurance processes. These inefficiencies negatively affected patient satisfaction, created avoidable costs, and contributed to environmental waste.

Methods:
The solution was a fully integrated, AI-driven system designed and developed by the hospital's internal IT department. This ensured that the innovation was aligned with the clinic's workflows and adaptable to emerging needs. The system includes six key components:

1. document ingestion through optical character recognition (OCR),
2. data extraction and validation using natural language processing (NLP),
3. automatic form completion and mapping into the electronic medical record (EMR),
4. real-time error detection,
5. queue optimisation and scheduling
6. biometric signatures for consent and legal documentation.

How the process works in practice:

- Document ingestion: Paper insurance forms and Form 100 are scanned with OCR technology at more than 98 percent accuracy.
- Data extraction: NLP algorithms capture patient ID, insurance policy, ICD codes, and physician instructions, then cross-check them against the EMR to prevent duplication. Baseline audit showed manual entry required about 42 keystrokes per form, with 93 percent accuracy. With AI, keystrokes were eliminated entirely, and accuracy improved to 99.5 percent.

- Form auto-completion: Extracted data is mapped directly into the EMR and billing system. Productivity increased to 118 forms per hour, compared with 12–15 forms per hour manually, representing a six to eight times gain.
- Error detection: Logic rules verify fields before submission. Between January and June 2024, AI flagged more than 85 faulty submissions, preventing delays in patient care.
- Queue management: Patients are dynamically assigned queue positions, reducing average waiting time from 32 minutes to 18 minutes, a 43.7 percent reduction.
- Biometric signatures: Fingerprint or digital pad signatures replaced paper consent forms, saving 22,000 GEL (about USD 8,100) annually in archiving costs.

Patient and staff perspectives reinforced these results. The system is also future proof. New modules are under development, including predictive staffing allocation and pharmacy e-prescription automation. This ensures continuous improvement and long-term adaptability.

Conclusions:
Todua Clinic's AI initiative delivered measurable improvements in safety, sustainability, efficiency, and patient experience. By embedding innovation into core workflows, the project set a new national benchmark and positioned the hospital among leading international examples of digital healthcare transformation.

REPORT

APPLICATION OF ACHSI PRINCIPLES

1.Consumer Focus
From the outset, patients were the primary drivers of this project. Long before the first line of code was written, the clinic undertook a structured process to understand patient needs and frustrations with administrative services. Between January and August 2023, Todua Clinic's quality unit conducted twelve focus groups and distributed monthly surveys that collectively captured responses from more than 1,250 patients across oncology, neurology, and general outpatient services. The results were consistent: patients reported average waiting times of 32 minutes before reaching a registrar, dissatisfaction with repeatedly signing paper forms, and confusion over insurance documentation that often-caused delays in receiving care.

Patients' requests included clearer communication about appointments, reduced duplication of information, and shorter waiting times. In response, the AI system incorporated automated SMS reminders, biometric signatures, and queue optimisation. These features directly addressed the concerns raised, ensuring that patients experienced a visible change in their journey.

2. Effective Leadership
Leadership was critical in transforming the project from an idea into a large-scale, hospital-wide innovation. The Chief Executive Officer, CFO, Medical Director, and Head of IT jointly sponsored the initiative, framing it as a core strategic priority rather than a side project. Their commitment was evident through regular communication, resource allocation, and personal involvement.

A formal steering committee was established in early 2024 to provide governance. The committee included five IT specialists, four administrative managers, three clinicians, two finance officers, and one quality manager. Meetings were held every month to review progress, monitor risks, and adjust priorities. Minutes were circulated to the executive board, ensuring transparency and accountability at the highest level.

Leaders also ensured that adequate resources were available. Instead of outsourcing to external vendors, leadership backed an in-house build, emphasising ownership, adaptability, and national expertise development. This decision reduced long-term dependency and created capacity for future digital innovations.

Training was prioritised. In the first quarter of 2024, 46 administrative staff and 112 clinical staff were trained on the new system, with refresher workshops scheduled quarterly. Leadership emphasised that the AI project was not about cutting jobs but about "making patient care smoother." This message was crucial in gaining staff buy-in and

overcoming resistance. As one registrar said during evaluation interviews: "When managers explained that this would save us time and not eliminate our roles, we felt safe and were ready to learn."

The leadership team also introduced clear key performance targets: reducing administrative errors by at least 60 percent, cutting waiting times below 20 minutes, and improving patient satisfaction by 25 percent. These metrics were reported monthly on a quality dashboard visible to senior management and department heads.

In summary, leadership created the vision, provided resources, removed obstacles, and maintained alignment with strategic goals. Their proactive and transparent engagement transformed the project into a hospital-wide success rather than a narrow IT initiative.

3. Continuous Improvement

The project was not a one-time installation but a continuous improvement journey. Development followed the Plan–Do–Study–Act (PDSA) cycle, which ensured iterative testing, evaluation, and refinement.

Planning began with mapping patient journeys and identifying bottlenecks. Three areas emerged as priorities: registration, insurance form completion, and consent documentation. Prototypes were then designed for each.

The "Do" phase involved small-scale pilots. For example, the OCR/NLP module for insurance forms was tested in the neurology outpatient department. Initial accuracy for handwritten entries was 94 percent. After retraining the algorithm with 3,000 scanned samples, accuracy rose to 99.5 percent. Similarly, biometric signature technology was piloted in radiology with 200 patients before being rolled out across all departments.

The "Study" phase relied on both quantitative audits and qualitative feedback. Staff were encouraged to log issues through a digital form. In the first three months, 320 issues were reported; 85 percent were resolved within one week. Suggestions included adjusting the SMS reminder font size and simplifying the registrar interface.

The "Act" phase involved scaling successful pilots and embedding updates. Queue management, initially limited to oncology, was extended hospital-wide after demonstrating a 43.7 percent reduction in waiting times.

Continuous improvement remains ongoing. A predictive staffing model is being developed using six months of data to forecast peak demand hours and reallocate staff dynamically. Early simulations suggest it could reduce average waiting times further to under 15 minutes.

This cycle of piloting, measuring, learning, and adapting demonstrates a culture of continuous quality improvement rather than one-off change. Staff engagement in feedback loops and the ability to incorporate adjustments quickly have ensured the system continues to evolve with user and patient needs.

4. Evidence of Outcomes

The project's outcomes are supported by robust quantitative and qualitative evidence.

Quantitative results (baseline January–June 2024 compared with July–December 2024):

- Administrative errors reduced from 7.8 to 2.3 per 1,000 forms, a 70 percent decrease.
- Average registration time fell from 6.5 to 3.8 minutes, a 42 percent improvement.
- Throughput per registrar increased from 65 to 126 patients per day, representing a 94 percent gain.
- Three full-time equivalent staff were redeployed from paperwork to direct patient care, saving approximately 5,200 staff hours annually.
- No-show rates declined from 14 percent to 11 percent, a 21 percent reduction.

Qualitative results provide context for the numbers. Patient satisfaction surveys showed a 28 percent improvement in ratings of administrative services. Open comments highlighted reduced stress and increased trust. One respondent said: "I used to avoid appointments because of the hassle at reception. Now it feels effortless."

Staff feedback echoed these themes. In an internal survey, 25 percent more staff reported feeling they had "sufficient time for patient interaction." One registrar stated: "The AI does the paperwork; I can finally look my patient in the eye instead of at a keyboard." This shift contributed to higher morale and reduced burnout.

Audit methodology strengthened confidence in the data. Random audits of 1,200 insurance forms before implementation and 1,350 after implementation were conducted by the pharmacy and quality units. Waiting time measurements were based on electronic queue logs from more than 12,500 patient visits.

Together, these outcomes show measurable improvements in efficiency, safety, sustainability, patient satisfaction, and workforce well-being.

5. Striving for Best Practice

Todua Clinic's AI project demonstrates alignment with both national priorities and international best practice.

At the national level, it is the first healthcare provider in Georgia to implement AI-driven administrative automation. This positions the clinic as a pioneer and provides a model for replication in other Georgian hospitals. Discussions are already underway with the Ministry of Health about piloting the insurance validation module on a national scale.

Best practice is also evident in sustainability and adaptability. The system's modular design allows for continuous expansion. Planned modules include sepsis alerts, oncology follow-up monitoring, and AI-driven drug stock prediction. By designing a flexible architecture, the clinic ensured that the innovation would evolve with medical and technological progress.

The project also demonstrates best practice in governance and culture. By choosing in-house development, leadership built national capacity and avoided vendor lock-in. By involving staff and patients in co-design, the clinic ensured acceptance and ownership. By embedding measurable metrics, the project proved not only innovation but also accountability.

In conclusion, Todua Clinic's project exemplifies clinical excellence in sustainability and service delivery. It has transformed patient experiences, empowered staff, reduced errors, saved costs, and protected the environment, all while positioning the clinic as a national and international leader. This is precisely the type of best practice that the ACHS Quality Improvement Awards seek to recognise and celebrate.

INNOVATION IN PRACTICE AND PROCESS

Innovation in this project did not stop at simply digitising paperwork; it redefined how administrative services are understood and delivered in a hospital environment.

The first level of innovation was integration across multiple functions. Instead of deploying separate digital solutions for forms, queues, and signatures, Todua Clinic built a unified platform that links these processes end-to-end. A patient who arrives at reception now moves through one seamless digital journey: scanning, automatic validation, queue assignment, and biometric confirmation. This "single flow" design is novel in Georgia and rare internationally, where many hospitals still use fragmented systems.

The second layer was predictive intelligence. Unlike static registration systems, the AI uses patterns from previous months to anticipate errors and peak loads. For example, the system recognises that Monday mornings produce more incomplete insurance submissions and automatically alerts registrars to double-check flagged entries. Early pilots of predictive queue balancing show waiting times can fall below 15 minutes, something previously unattainable.

Another innovation lies in staff empowerment. Instead of replacing roles, the system shifted them. Registrars are no longer data clerks; they are now patient guides. Training emphasised communication and service, while the AI absorbed repetitive typing. One registrar explained: "Before, I typed; now I explain. My work feels more professional." This cultural redesign is as significant as the technical one.

The project also pioneered biometric governance in Georgia's health sector. Consent forms were historically vulnerable to loss or falsification. Digital signatures, stored securely in the system, create a verifiable and auditable trail. Legal experts confirmed this innovation enhances compliance with data-protection standards and builds patient trust.

Finally, the innovation extended to environmental stewardship. By linking administrative automation with sustainability metrics, the project transformed ecological responsibility into a measurable outcome.

Taken together, these innovations show that Todua Clinic did not just automate — it reimagined workflows, empowered staff, embedded compliance, and linked digital progress to ecological accountability.

APPLICABILITY TO OTHER SETTINGS

The model developed at Todua Clinic can be applied across settings because it was designed to be modular and adaptable.

Small outpatient clinics could adopt only the OCR/NLP form recognition. Even without queue systems or biometrics, this single component can reduce data errors by 60–70 percent and speed registrations substantially.

Regional hospitals can benefit from the full package. Facilities with 100–200 daily patient registrations often struggle with bottlenecks and paper overload. By adopting the complete platform — form automation, queue management, and biometrics — they can replicate Todua's gains in efficiency and patient satisfaction.

Public health programs could also adapt parts of the system. The SMS reminder module, which reduced no-shows by 21 percent at Todua, could be used in vaccination drives or chronic disease monitoring, improving adherence. Insurance agencies could scale the validation tool nationally to reduce fraudulent submissions and accelerate approvals.

Internationally, the system demonstrates how resource-constrained countries can "leapfrog" intermediate stages of digitisation. Many middle-income countries are still introducing basic EMRs; Todua Clinic shows that with targeted design and modest investment; it is possible to move directly to AI-enhanced services. This lesson is applicable across Eastern Europe, Central Asia, and beyond.

The broader applicability comes from the cultural lessons. The project proved that staff buy-in is possible when technology is framed as supportive rather than threatening. By involving staff in co-design, resistance was minimal, and adoption rapid. This people-centred change model is exportable across contexts.

In summary, Todua Clinic's system is not just a local success but a blueprint for digital transformation in healthcare worldwide. Its modular design, measurable impact, ecological framing, and cultural acceptance make it suitable for replication across small clinics, large hospitals, national programs, and even international health systems.

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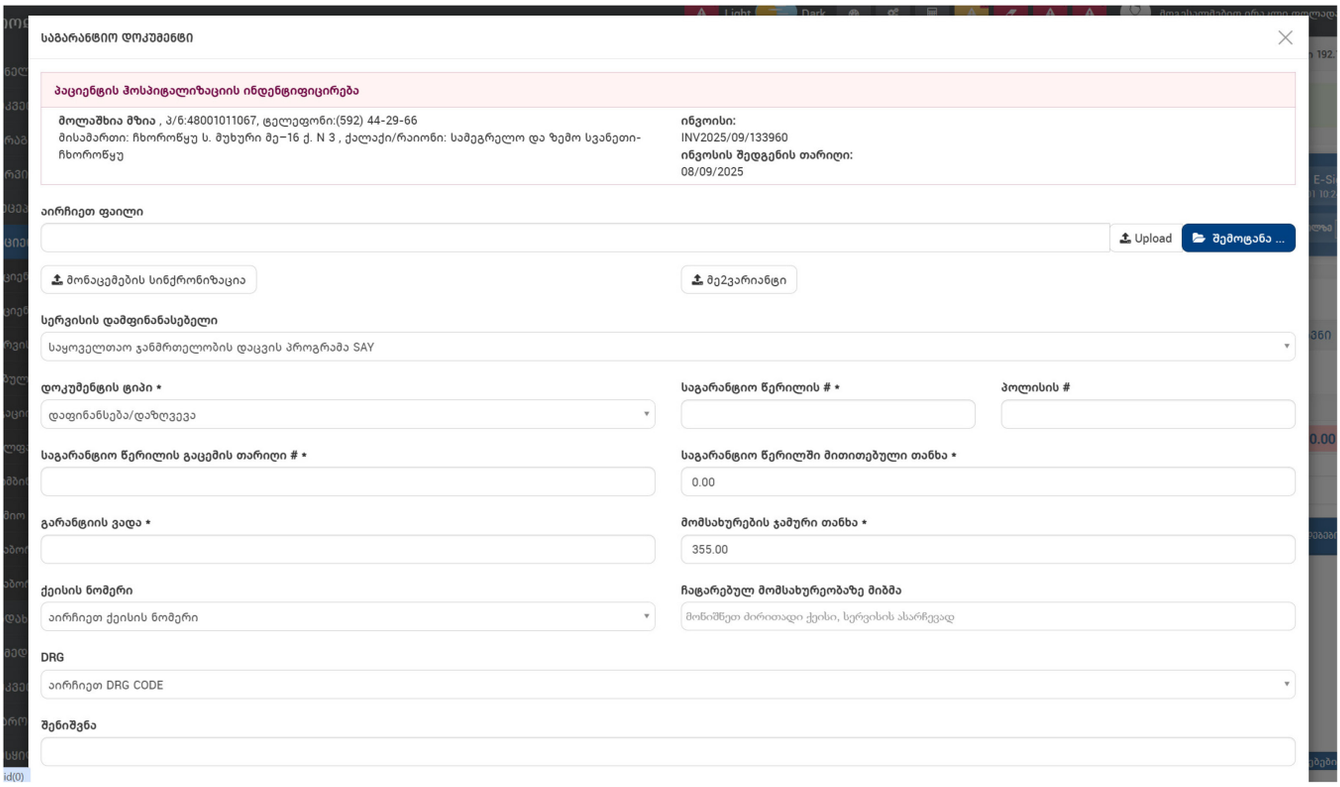
APPENDIX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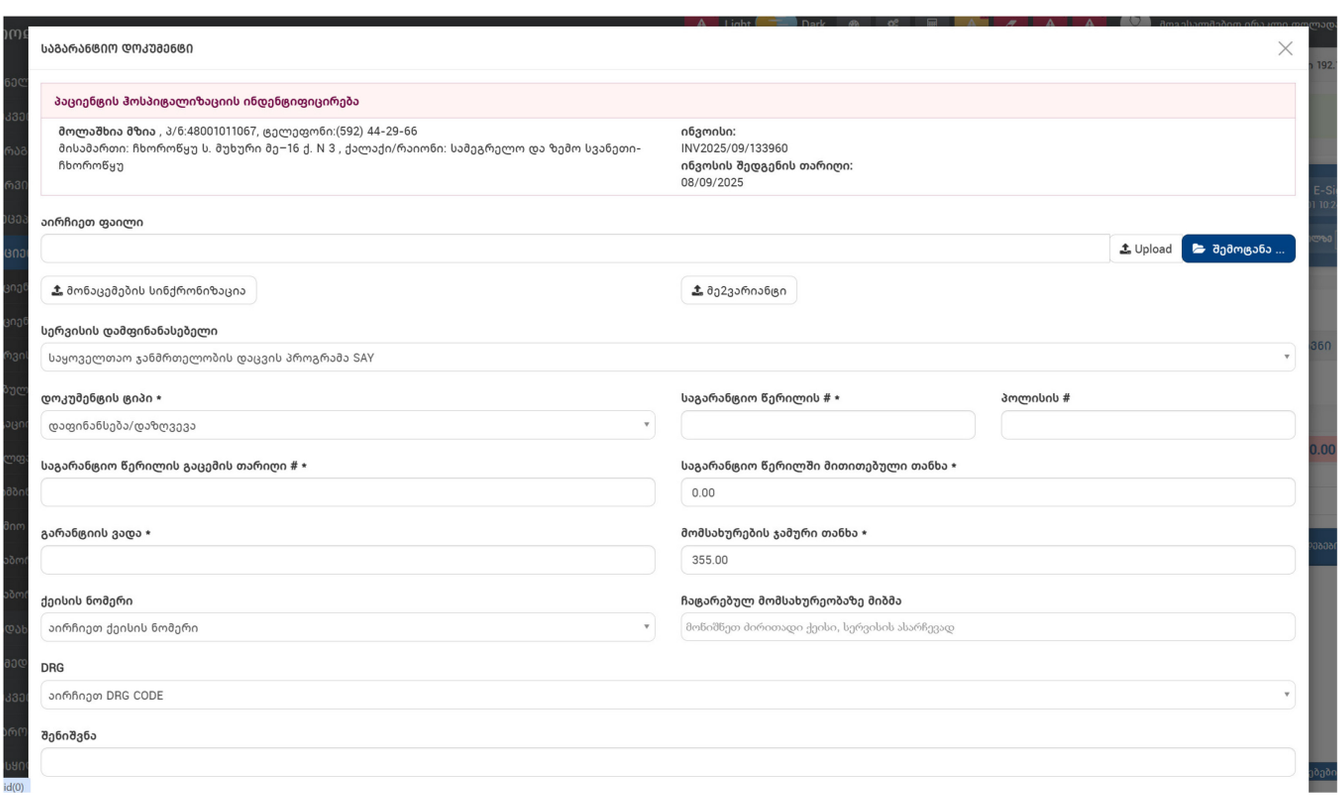
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SUSTAINABLE HEALTHCARE AND SERVICE DELIVERY

TABLE OF SUBMISSIONS

Dubai Health, UNITED ARAB EMIRATES

Reduce Waiting Time (In Days) To Get New Physician Appointment in Nephrology Clinic at Al Jalila Children's Specialty Hospital (AJCH), DUBAI HEALTH

Dr Mohammed Khan

Dubai Health, UNITED ARAB EMIRATES

Improving Reliability of Paediatric Early Warning Scores (PEWS) Through Human-Centred Workflow Redesign: A Two-Cycle Clinical Audit of Practice Fidelity and Electronic Medical Record (EMR) Enabled Workflow at Al Jalila Children's Specialty Hospital, DUBAI HEALTH

Dr Mohammed Khan

Dubai Health, UNITED ARAB EMIRATES

Focusing On System Redesign, Flow Optimisation, And Scalable Impact of Medical Assessment Unit (MAU) at DUBAI HEALTH

Dr Mohammed Khan

Emirates Group Medical Services, UNITED ARAB EMIRATES

Improving the Internal Supply Chain Process using FOCUS PDCA

Mrs Chetana Nayak

Hoan My Binh Duong Hospital, VIETNAM

Improving the Quality of Medication Information for Outpatients

Ms Hai Than Thi Thanh

Hoan My Da Lat Hospital, VIETNAM

Enhancing the Effectiveness of Health Counselling and Patient Education at The Outpatient Department of Hoan My Da Lat Hospital

Mrs Hoa Nguyen Thi

Hoan My Medical Corporation, VIETNAM

Systematising Quality Management Activities in Hoan My Medical Group using the Power Platform

Mr Duy Nguyen

Hoan My Sai Gon Hospital, VIETNAM

Software Application in Receiving and Delivering Test Results Sent to Hoan My Sai Gon Hospital

Ms Trang Do

Hoan My Sai Gon Hospital, Vietnam

Reducing Time - Reporting and Increasing Compliance Clinical Monitoring for Internal Audits Via Digital Transformation (Microsoft List and Dashboard Bi) in Hoan My Sai Gon Hospital Healthcare

Ms Trang Do

Hoan My Sai Gon Hospital, VIETNAM

Hoan My Sai Gon Hospital Innovates Training Methods in Hospitals Through the Application of Digital Training Software

Ms Trang Do

Hoan My Thu Duc International General Hospital, VIETNAM

Utilisation of Information Technology for Patient Medication Counselling in Year 2024-2025

Ms Hoan My Thu Duc

Hoan My Thu Duc International General Hospital, VIETNAM

Improving the Efficiency of Surgical Instrument Management and Utilisation in the Department of Anaesthesia and Resuscitation

Ms Hoan My Thu Duc

Hoan My Thu Duc International General Hospital, VIETNAM

Improving Sterilisation Quality of Surgical Instruments Using Fixation Clamps: Towards Patient Safety and Environmental Protection

Ms Hoan My Thu Duc

Hong Kong Baptist Hospital, HONG KONG SAR

Pioneering Sustainable Innovation: Improved Healthcare Service Delivery at Hong Kong Baptist Hospital

Mr Leon Wai Li

Hong Kong Baptist Hospital, HONG KONG SAR

Integrating Hospital Development, Sustainability and Patient Safety: An Innovative In-House Renovation and Construction App as a Pioneering Solution.

Ms Yin Yin Wong

Hong Kong Baptist Hospital, HONG KONG SAR

Patient-Centred Lift Management in Hospital Expansion

Mr Leon Wai Li

Hung Vuong Hospital, VIETNAM

Improving The Quality of Newborn Care with Infant Relaxation Massage Therapy at Hung Vuong Hospital

Ms Anh Nguyen

Island Hospital Penang, MALAYSIA

Recycling Waste Segregation Awareness Drive

Ms Christine Kon

Mouwasat Hospital, SAUDI ARABIA

Enhancing Dialysis Unit Capacity and Service Sustainability

Dr Heraa Zarea

Mouwasat Hospital Dammam, SAUDI ARABIA

Digital Innovation for Excellence in Stroke Care

Dr Doaa Elzanaty

Saudi German Heath Egypt, EGYPT

Redefining Global Healthcare Excellence: A Transformative Journey in International Patient Services

Dr Dina El-Maghraby

Saudi German Heath Egypt, EGYPT

Dynamic Inventory Management System (DIMS): Proactive and Collaborative Pharmaceutical Inventory Management to transform Stagnant Medication Burden into a Sustainable Opportunity.

Dr Sameh Omran

Sunway Medical Centre, MALAYSIA

Operations Department

Sustainable Healthcare: Integrating Innovation, Care, and Environmental Responsibility

Mr Leong Ming Chung, Ms Kalliamah Sanjeevi and Ms Nur Shalinie Binti Ridzuan

The National Kidney Foundation Singapore, SINGAPORE

Community-Based Model of Care to Reduce Hospital Referrals for Tunnelled Haemodialysis Catheter (THC) Dysfunction

Ms Meihua Lu

Todua Clinic, GEORGIA

IT Department

Artificial Intelligence for Sustainable and Patient-Centred Service Delivery at Todua Clinic

Mr Irakli Poladashvili, Mr Anri Chkhaidze, Mr Lasha Sharvadze and Ms Sophio Gognadze

HEALTHCARE MEASUREMENT

WINNER

Mouwasat Hospital Jubail, SAUDI ARABIA

Quality & Patient Safety Department

Improving Safety, Quality and Efficiency of Care Through the Development of a Patient Reported Outcome Measures (PROMS)

Dr. Samer Abdu, Dr. Heraa Zarea, Mis Mariam Zanati, Dr. Hytham Mousa, Eden Lapizar, Mary Ann Bathan and Mr. Mohamed A. El-Nabarawy

AIM

- To improve the health of the population, by preventing and better managing prevalent, costly and chronic diseases
- To improve efficiency and reduce the cost of providing care
- To enhance the patient experience, by motivating and engaging patients to play an active role in their own care.
- To improve provider satisfaction through access to tools and resources that address burdens and burnout.

SUMMARY ABSTRACT

Introduction:
In Saudi Arabia and according to the Council of Health Insurance (CHI), significant population growth rates and a high prevalence of chronic no communicable diseases are driving the need to shift to more integrated care delivery models to improve coordination of care, reduce cost and improve outcomes. The practice of recording and responding to patient-reported outcome measures (PROMs) is being formalised as healthcare ecosystem stakeholders look for more meaningful ways to determine success from medical intervention.

Method:
The Kingdom of Saudi Arabia (KSA) has incorporated this perspective into its Vision 2030 programme, as it aims to provide better health, better care, and better value to its people.

Mouwasat Hospital Jubail adopt and initiate the PROMs to standardise practices, measures and systems to optimise the opportunity for PROMs-based care decisions and continuous healthcare improvements and efficiencies.

The Patient Reported Outcomes Measures are designed to assess the physical, mental and emotional state of patients and their perspectives to provide patient-centred care into future decision-making, also enable cost-effectiveness analysis to ensure the interventions resources efficiency.

One of the biggest catalysts to PROMs adoption is involving relevant stakeholders (clinicians, implementation leads, patients, practice leadership, etc.) in the planning and implementation process. It is imperative that the clinicians choose PROMs that they feel are relevant and that PROMs utilisation be incorporated into existing workflows.

Mouasat Hospital convened a project team to better understand facilitators and barriers in effectively utilising PROMs and the benefits of consistent utilisation to clinicians and patients.

The team decided to use the Plan- Do- Check- Act (PDCA) methodology and Lean tools to address this issue.

Results:
This project details our strategy and progress to date, and the key success factors we have identified. This involves both the factors to help and the obstacles that hinder the efficient use of PROMs data collection abilities.

This involves recognising both the factors that help and the obstacles that hinder the efficient use of PROMs data collection abilities.

Conclusions:
Our work revealed that effective PROMs utilisation cannot only enhance the quality of patient care, satisfaction, and experience, but can also enhance practice efficiencies, and drive practice growth.

REPORT

APPLICATION OF ACHSI PRINCIPLES

1. Consumer Focus
Patient centricity: placing patients, citizens and residents at the forefront to ensure they receive a superior healthcare experience.

PROMs assess patient health outcomes like pain, fatigue, mobility, or depression. These measures are often used to assess the effectiveness of treatments—like knee or hip replacements or spine surgery—from the patient's perspective. PROMs can also provide evidence on which treatments are most effective for specific patient groups, ultimately helping to achieve positive health outcomes efficiently.

2. Effective Leadership
The project reflects our hospital leadership commitment of involving patients and the public within the wider context of the development and evaluation of our health care service delivery and the compliance with the Council of Health Insurance (CHI) mandates. Driving efficiency through technology prioritising patient safety and providing the necessary resources to improve the patient experience and exceed expectations regarding the care provided. Increasing the staff satisfaction through reducing the workload and eliminating the resource wastage.

3. Continuous Improvement
Value-based healthcare sustainability: to serve the population affordably well into the future. Recording and measuring outcomes in terms that are more meaningful to patients is one direct way that Mouwasat Hospital Jubail is improving the quality, efficiency and sustainability of its health system.

4. Evidence of Outcomes
- Improvement of Patient satisfaction from 79% to 84%
- Decreased percentage of diabetic patients with Haemoglobin A1c (HbA1c) poor control (>7%) to 20.5%
- Cost effectiveness:
    - Average Cost of a Hospital Stay day for diabetic patient is 9,000 SR
    - Length of stay decreased from 5.2 to 2.4 days
    - Average total cost for Diabetic patient in 2023 was (5.2*9,000) =46,800 SR
    - Average total cost for Diabetic patient in 2024 is (2.4*9,000) =21,600 SR
    - Cost reduction per diabetic patient admission is: 46,800-21,600= 25,200 SR

5. Striving for Best Practice
The plans are in place for a substantial, game-changing transition in Mouwasat's healthcare planning and delivery. This will ensure that the very best care will be available to all citizens well into the future, as the population grows and as requirements evolve. Our strategy will help place the patient at the heart of all critical decisions, ultimately supporting Saudi Arabia's shift towards value-based payments and value-based healthcare.

INNOVATION IN PRACTICE AND PROCESS

According to the CHI; Linking payments to PROMS achievement and costs. One example is the integration with the financing of diagnosis-related groups (DRGs).

APPLICABILITY TO OTHER SETTINGS

Hospital wide roll-out of PROMs across the other priority areas; The plans are in place for a substantial, game-changing transition in Mouwasat healthcare planning and delivery which will ensure that the very best care will be available to all citizens well into the future, as the population grows and as requirements evolve. Our strategy will help place the patient at the heart of all critical decisions, ultimately supporting Saudi Arabia's shift towards value-based payments and value-based healthcare.

REFERENCES

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APPENDIX

1. Plan

Criteria	Score 3	Score 2	Score 1	Score 0	Total Score
PATIENT EXPECTATIONS/ PROBLEM PRONE	Problems in this area highly positive effect on patient expectations	Moderate positive effect on patient expectations	Minimal positive effect on patient expectations	No positive effect on patient expectations	3
TIME TO ACCOMPLISH	To be completed within 1-3 months	To be completed within 4-6 months	To be completed within 7-9 months	To be completed within 10-12 months	3
HIGH VOLUME	Affect high number patients	Affect moderate number of patients	Affect small number of patients	No affect at all	3
RISK TO PATIENTS	Process problems noted with increased risk to patients	Process problems noted with moderate risk to patients.	Process problems noted with low risk to patients.	Process problems noted with no risk to patients.	0
COST/ EFFECIENCY	Significant impact on the cost and/or revenue	Moderate impact on the cost and/or revenue	Minimal impact on the cost and/or revenue	No impact on the cost and/or revenue	3
TOTAL					12

11 - 15	*HIGH PRIORITY*
6 -10	*MODERATE PRIORITY*
5	*LOW PRIORITY*
1- 4	*NO PRIORITY*

Project Selection: "**Appendix 1**"

Team Members:
1. Project sponsor: Dr. Samer (CMS)
2. Team facilitators: Dr. Heraa Zarea (PI manager)
3. Team leader: Dr. Salah Ahmed (CMO)
4. Project team members: Dr. Nagwa Roshdi (Endocrinology Consultant), Ms. Noha Nammour (CNS)
5. Team recorder: Mrs. Mariam (PI coordinator)

Methodology:
The team decided to use the PDCA methodology and Lean tools to address this issue.
Criteria of selection of PROMs:

Based on the top 5 Diagnosis & the top 5 procedures we established PROMs priority areas, identified through a prioritisation assessment process and validation and they are aligned with the prevalence of the selected medical interventions among the Saudi Arabian population in Jubail city.

Identifying priority clinical areas has been another recommended practice, to maintain focus and accelerate progress. Proactive stakeholder engagement and active use of the findings to guide service quality improvements and drive value-based healthcare and payment, are further drivers of buy-in and ongoing success.

Stage 1: The pilot implementation of PROMs in one of the priority areas within a 3 month (Diabetic Patients)
Stage 2; Evaluation of the process progress and determine the facilitators and barriers in effectively implementing PROMs
Stage 3: Hospital wide roll-out of PROMs across the other priority areas will overlap with the above, taking up to 1 year.

Seeing through the strategic initiatives during the pilot phase will be crucial to furthering an exemplary programmer that can be rolled out hospital wide. The staged implementation, meanwhile, will help build momentum and capabilities and allow lessons to be learned and fed into the subsequent phases along the way.

Goals:
Define outcomes retrospectively
To improve the health of the population, by preventing and better managing prevalent, costly and chronic diseases

- Increase Percentage of diabetic patients with Hemoglobin A1c (HbA1c) poor control (>7%); <15
- Decrease No. of admitted patients due to Diabetes complications by 40%
- Decrease average LOS for Diabetic patients to 2.5
- Decrease ER visits for Diabetic Patients

To enhance the patient experience, by motivating and engaging patients to play an active role in their own care

- Improve the percentage of Diabetes Patient satisfaction >85%

2. Do

An action plan was developed by the team members to be implemented within a specific timeframe:
Design and integrate PROMs into care delivery based on a valid and updated evidence-based practice guidelines; Review of the questionnaire by the CMO and the Endocrinology Consultants to be approved and implemented.

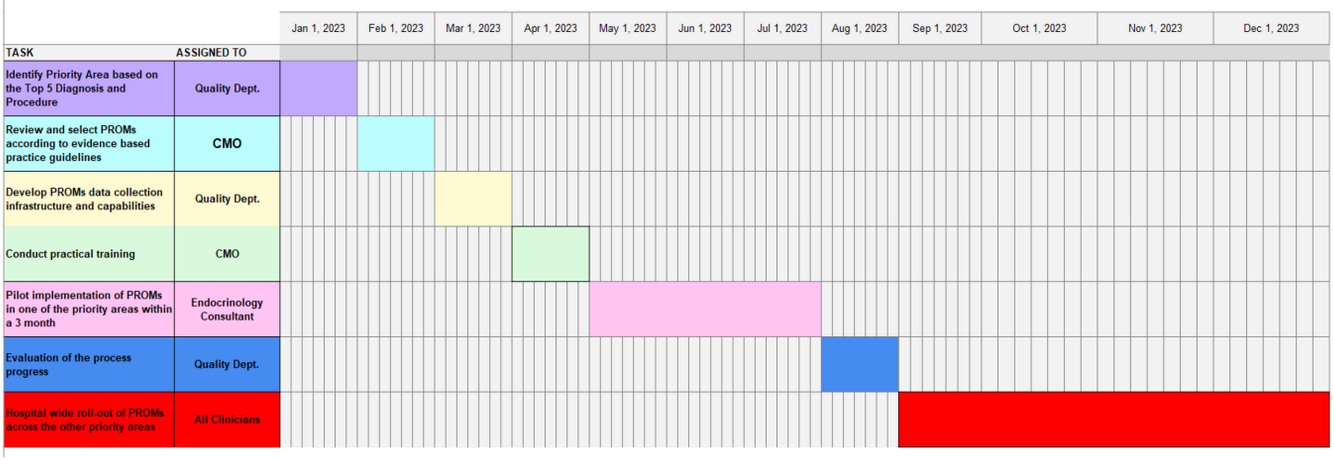
Develop PROMs data collection infrastructure and capabilities; paper forms will be distributed in the Diabetic clinic by the clerk and collected on daily basis.

Conduct practical training to review the process for utilising PROMs, the responsibilities of staff in collecting the information, how the data is accessed and interpreted, and best practices in sharing the information with patients. identifying pathways and/or next steps for patients depending on their score and sensitively communicating with patients and other clinicians about the results.

Gant chart: **"Appendix 2"**

Project start: 1/1/2023

Improving safety, quality and efficiency of care through the development of a Patient reported outcome measures (PROMS)



3. Check

This phase typically begins with a pilot of a small number of patients or the patients of a single or few clinician champions to ensure clinicians are comfortable with the process and identify any gaps in the process that were not previously identified. The bugs should be worked out in this phase before rolling the process out to a wider audience and patient population. During a pilot phase (and beyond), there should be opportunities to provide feedback.

Perceived barriers to implementing PROMs

- Inability to explain the PROMs at the time of clinical visit due to the limited visit slot (10 Minutes)
- Some clinicians not committed to use the PROMs tool because of insufficient training.
- Cost of implementation; printing huge of paper daily by the quality department (PROMs Forms) which increase the waste, distributing to the clinics by the clerk, provide single use pen for each patient by the purchasing department.
- Trust issue: Patients do not see the value in collecting PROMs while it is not included in his decision making.
- Collection, aggregation and analysis is time-consuming for the quality Department and lead to inadequate action plan and inability to measure the Key Performance Improvement.

After evaluation of the Process progress; the Team members decides to make some modification based on lean Methodology to improve the timeliness and the effectiveness of the PROMs process by elimination of non-value added activities (waste) and the reduction of variation in processes through incorporating technology that can support and simplify the process for the patient to easily complete the questionnaires prior to their clinician visit, and ensuring that the clinician can easily access the scores during the patient visit can facilitate utilisation.

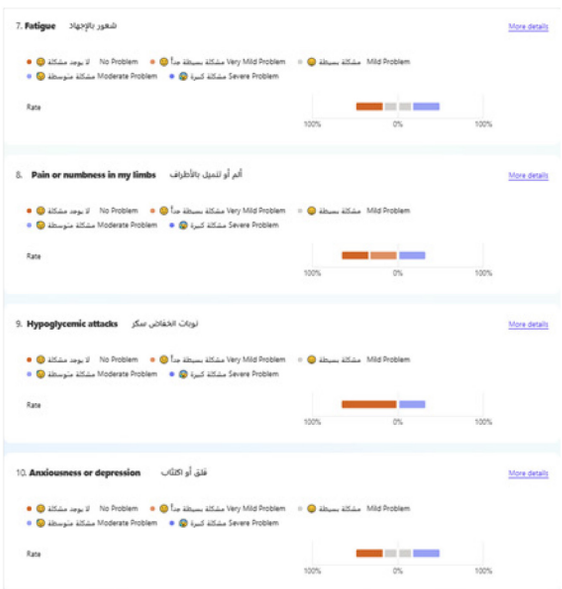
The issue was raised to the Leadership to provide the resources to purchase a software application to deal the PROMs process easily presenting the facilitators to software PROMs adoption.

MOUWASAT HOSPITAL
Jubail

Problem Areas In Diabetes (PAID) Scale

Instructions: Which of the following diabetes issues are **currently** a problem for you? Tick the box that gives the best answer for you. Please provide an answer for each question.

		Not a problem	Minor problem	Moderate problem	Somewhat serious problem	Serious problem
1	Not having clear and concrete goals for your diabetes care?	☐0	☐1	☐2	☐3	☐4
2	Feeling discouraged with your diabetes treatment plan?	☐0	☐1	☐2	☐3	☐4
3	Feeling scared when you think about living with diabetes?	☐0	☐1	☐2	☐3	☐4
4	Uncomfortable social situations related to your diabetes care (e.g. people telling you what to eat)?	☐0	☐1	☐2	☐3	☐4
5	Feelings of deprivation regarding food and meals?	☐0	☐1	☐2	☐3	☐4
6	Feeling depressed when you think about living with diabetes?	☐0	☐1	☐2	☐3	☐4
7	Not knowing if your mood or feelings are related to your diabetes?	☐0	☐1	☐2	☐3	☐4
8	Feeling overwhelmed by your diabetes?	☐0	☐1	☐2	☐3	☐4
9	Worrying about low blood glucose reactions?	☐0	☐1	☐2	☐3	☐4
10	Feeling angry when you think about living with diabetes?	☐0	☐1	☐2	☐3	☐4
11	Feeling constantly concerned about food and eating?	☐0	☐1	☐2	☐3	☐4
12	Worrying about the future and the possibility of serious complications?	☐0	☐1	☐2	☐3	☐4
13	Feelings of guilt or anxiety when you get off track with your diabetes management?	☐0	☐1	☐2	☐3	☐4
14	Not accepting your diabetes?	☐0	☐1	☐2	☐3	☐4
15	Feeling unsatisfied with your diabetes physician?	☐0	☐1	☐2	☐3	☐4
16	Feeling that diabetes is taking up too much of your mental and physical energy every day?	☐0	☐1	☐2	☐3	☐4
17	Feeling alone with your diabetes?	☐0	☐1	☐2	☐3	☐4
18	Feeling that your friends and family are not supportive of your diabetes management efforts?	☐0	☐1	☐2	☐3	☐4
19	Coping with complications of diabetes?	☐0	☐1	☐2	☐3	☐4
20	Feeling burned out by the constant effort needed to manage diabetes?	☐0	☐1	☐2	☐3	☐4



Diabetic PROMs Hard Copy: "**Appendix 3"**

Diabetic PROMs Barcode: **"Appendix 4"**

Facilitators to software PROMs adoption:
Facilitating technology support; Creation of QR-Code to be scanned by the patient during the triage process Making processes compatible with clinician workflow to enhance practice efficiency through Ability to access and display PROMs by the physician at the time of clinical visit for decision making.

Involving the right stakeholders in implementing PROMs processes; IT, triage nurse, Clinicians, quality dept. Simplifying the collection process; Patient through application; Automatic collection and analysis of response

By using patient-friendly versions of PROMs that are easy for the patient to understand, clinicians can reduce the amount of time they spend explaining the PROMs score. Additionally, incorporating technology that can support and simplify the process for the patient to easily complete the questionnaires prior to their clinician visit, and ensuring that the clinician can easily access the scores during the patient visit can facilitate utilisation.

4. Act

When patients and clinicians see the value in PROMs, it greatly increases the likelihood of adoption. Identifying the outcomes desired by individual patients is crucial for both the clinicians and patients to feel that PROMs are useful.

Analysis of the PROMs & the action taken: **Appendix 5:** "Data Analysis"

The Problem Areas in Diabetes (PAID) scale is a well validated, psychometrically robust questionnaire with 20 items.

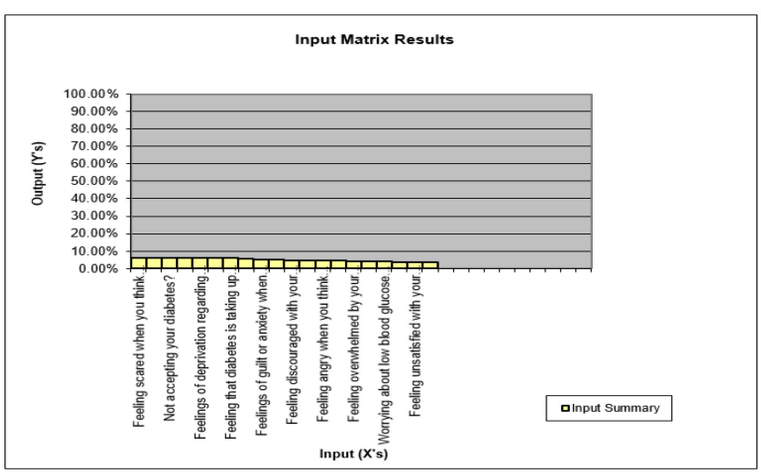
XY Diagram Table

Process:
Date:

Diabetes PROM Analysis

	Input Variables (Xs)	Output Variables (Ys) Description	Weight	1 Not a problem	2 Minor problem	3 Moderate problem	4 Somewahy serious problem	5 Serious problem	Ranking
				1	2	3	4	5	
1	Not having clear and concrete goals for your diabetes care?			2	4	29	5	4	137
2	Feeling discouraged with your diabetes treatment plan?			4	9	10	19	2	138
3	Feeling scared when you think about living with diabetes?			3	4	2	7	28	185
4	Uncomfortable social situations related to your diabetes care (e.g. people telling you what to eat)?			12	13	7	9	3	110
5	Feelings of deprivation regarding food and meals?			2	3	7	13	19	176
6	Feeling depressed when you think about living with diabetes?			1	4	6	9	24	183
7	Not knowing if your mood or feelings are related to your diabetes?			9	7	5	11	12	142
8	Feeling overwhelmed by your diabetes?			7	9	14	11	3	126
9	Worrying about low blood glucose reactions?			5	16	13	6	4	120
10	Feeling angry when you think about living with diabetes?			6	9	14	7	8	134
11	Feeling constantly concerned about food and eating?			2	4	5	12	21	178
12	Worrying about the future and the possibility of serious complications?			1	4	10	11	18	173
13	Feelings of guilt or anxiety when you get off track with your diabetes management?			5	6	9	11	13	153
14	Not accepting your diabetes?			1	1	7	16	19	183
15	Feeling unsatisfied with your diabetes physician?			5	18	19	1	1	107
16	Feeling that diabetes is taking up too much of your mental and physical energy every day?			1	5	9	11	18	172
17	Feeling alone with your diabetes?			7	11	15	7	4	122
18	Feeling that your friends and family are not supportive of your diabetes management efforts?			14	12	9	6	3	104
19	Coping with complications of diabetes?			3	7	9	12	13	157
20	Feeling burned out by the constant effort needed to manage diabetes?			5	11	14	10	4	129

Input Variables		
Description	Ranking	Rank %
Feeling scared when you think about living with diabetes?	185	6.32%
Feeling depressed when you think about living with diabetes?	183	6.25%
Not accepting your diabetes?	183	6.25%
Feeling constantly concerned about food and eating?	178	6.08%
Feelings of deprivation regarding food and meals?	176	6.01%
Worrying about the future and the possibility of serious complications?	173	5.91%
Feeling that diabetes is taking up too much of your mental and physical energy every day?	172	5.87%
Coping with complications of diabetes?	157	5.36%
Feelings of guilt or anxiety when you get off track with your diabetes management?	153	5.22%
Not knowing if your mood or feelings are related to your diabetes?	142	4.85%
Feeling discouraged with your diabetes treatment plan?	138	4.71%
Not having clear and concrete goals for your diabetes care?	137	4.68%
Feeling angry when you think about living with diabetes?	134	4.57%
Feeling burned out by the constant effort needed to manage diabetes?	129	4.40%
Feeling overwhelmed by your diabetes?	126	4.30%
Feeling alone with your diabetes?	122	4.17%
Worrying about low blood glucose reactions?	120	4.10%
Uncomfortable social situations related to your diabetes care (e.g. people telling you what to eat)?	110	3.76%
Feeling unsatisfied with your diabetes physician?	107	3.65%
Feeling that your friends and family are not supportive of your diabetes management efforts?	104	3.55%

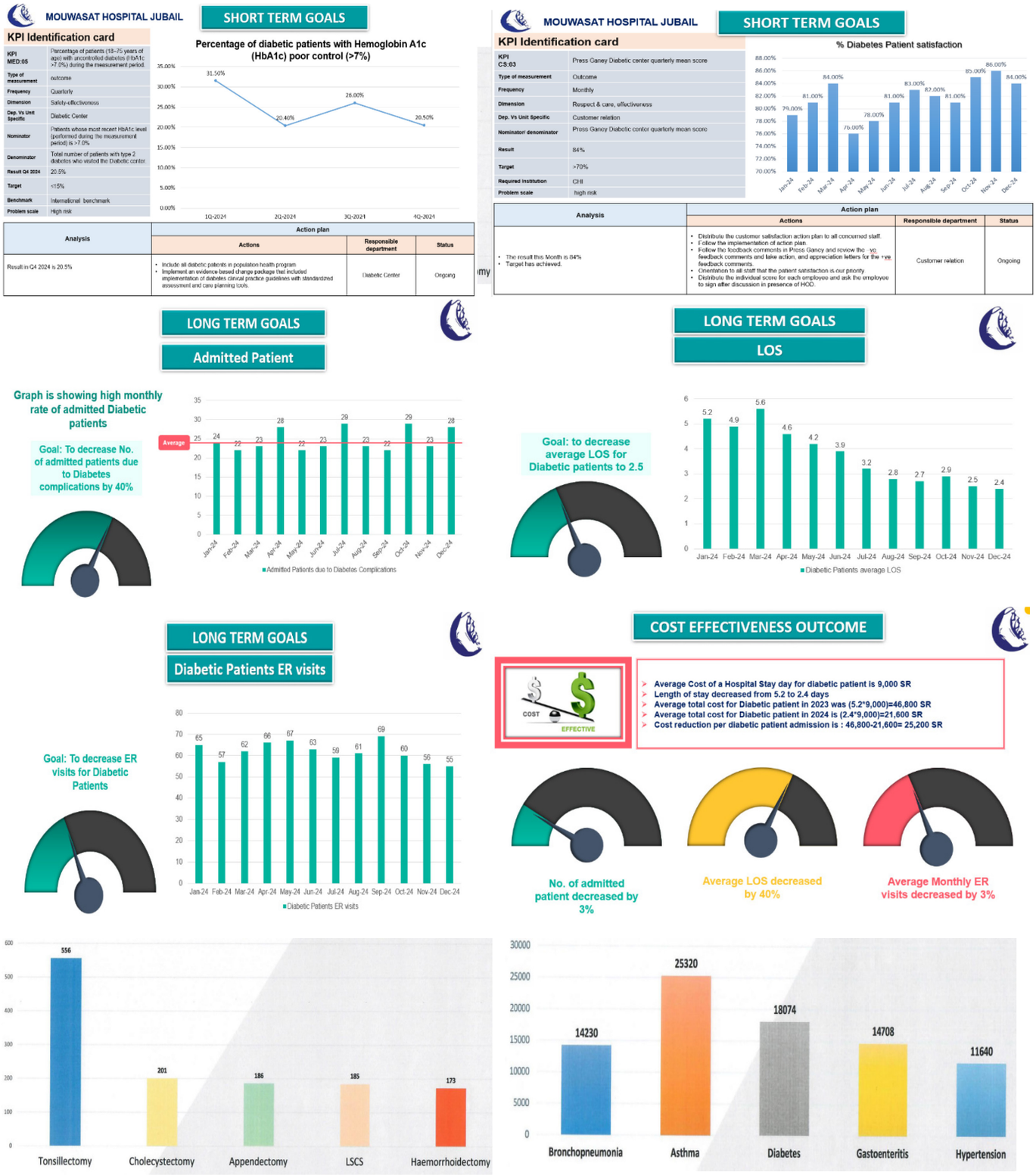


Output Variables	
Description	Weight
Serious proplem	5
Somewahy serious proplem	4
Moderate proplem	3
Minor proplem	2
Not a proplem	1

1) Feeling scared when you think about living with diabetes?
2) Feeling depressed when you think about living with diabetes?
3) Not accepting your diabetes?

Based on PROMs highest patient concern , We have to involve Social Worker to make assessment for every visited Diabetic Patient especially, new diagnosed

Measures of success: "Appendix 6"



Hospital wide roll-out of PROMs across the other priority areas; **Appendix 7**: "Top 5 Diagnosis & Top 5 Procedure"

HEALTHCARE MEASUREMENT

HIGHLY COMMENDED

Hoan My Sai Gon Hospital, VIETNAM

Quality Management Department

Data-Driven Quality Improvement: Establishing a Healthcare Measurement System Through Risk Library and Centralised Management to Enhance Patient Safety and Care Quality

Mr. Tran Chau Hoa, Ms. Do Thi Trang and Ms. Bui Ngoc Chau

AIM

"Data-Driven Quality Improvement Management" is a project to develop and implement a hospital-wide quality management model based on an evidence-based data system. It aims to transform quality improvement activities from sporadic, individual initiatives into a structured, data-driven approach through the creation of a standardised risk library as the foundation for initiating improvement projects. A centralised management system is established to monitor, evaluate, and sustain projects, ensuring alignment with hospital-wide objectives and measurable results. The project targets ≥90% of projects being linked to the risk library and ≥80% of projects sustaining results for more than 12 months, driving continuous improvement and enhancing patient safety and care quality.

SUMMARY ABSTRACT

Introduction:
In the context of the healthcare sector placing increasing emphasis on patient safety and the sustainability of quality improvement, many hospitals still face challenges due to improvement activities being largely spontaneous, lacking a common direction, and difficult to sustain over the long term.

Hoan My Saigon has a culture of continuous improvement with an average of nearly 120 initiatives and improvement per year; this situation is reflected in two main aspects clearly including:

Firstly, the foundation for developing quality improvement projects was primary based on scattered individual ideas that were not aligned with common objectives. Many initiatives did not directly address critical risks or major issues of the hospital. Secondly, the monitoring and sustainability of projects have not been effective post implementation. Some projects stopped at the initial stage without a mechanism for supervision or data to demonstrate long-term impact, leading to improvement results that are difficult to sustain.

Objectives:
To address this situation, our hospital is implementing the project "Data-Driven Improvement Management" with the goal of building a new management approach that ensures all improvements are based on objective data and supported by a transparent monitoring system. The core focus of the project is to establish a standardised risk library, consolidated from various data sources including incident reports, quality indicators, patient feedback, and internal audit results.

Discussion:
This library serves as a "roadmap" for departments in prioritising improvement initiatives, replacing the traditional approach that relied on individual ideas rather than the organisation's prioritised existing issues. As a result, projects are implemented not only with a focus on critical issues but also with ensured alignment and consistency across the entire hospital.

In parallel, the hospital is developing a centralised improvement project management system. This system enables the registration, tracking, and evaluation of each project's progress while providing data to support timely decision-making by the leadership team. The integration of this management tool not only helps sustain improvement results but also serves as a foundation for trend analysis and strategic planning in the future. The system is built using existing tools, requiring no additional investment costs, and is flexible to adjust based on usage needs.

The highlight of this model lies in its shift in management approach. Instead of focusing on "who has the idea," the project emphasises, "what the data shows should be prioritised." This change helps the hospital optimise resources, avoid dispersing efforts on low-value activities, and strengthen patient trust by directly addressing issues that impact on safety and service quality.

Another important factor is flexibility and scalability. The model can be applied at multiple levels: within individual departments, across the entire hospital, or even expanded to the healthcare system level. The management tool is also not limited by technology: hospitals can choose a suitable platform, from Excel to advanced management software, depending on available resources. This demonstrates the project's potential for broad application and suitability in various contexts.

Results:
The results after the implementation period show significant changes: the number of well-directed initiatives increased by 45%, the proportion of projects directly related to priority risks reached over 90%, and clinical, operational, and patient experience quality indicators have improved. More importantly, the project has driven a cultural shift: from spontaneous improvement efforts to a mindset where both healthcare staff and leadership recognise improvement as a continuous process based on evidence-driven data and accountability

Conclusion:
In summary, the "Data-Driven Improvement Management" project has enabled the hospital to establish a strategic quality improvement mechanism that focuses on patient needs while creating a transparent, scientific, and sustainable management foundation. The success of the project is reflected not only in improved performance indicators but also in the transformation of mindset and organisational culture. This demonstrates the value of a data-driven approach and represents a model that can serve as a best practice for scaling across the healthcare system.

REPORT

APPLICATION OF ACHSI PRINCIPLES

1. Consumer Focus
In the context of healthcare services placing increasing emphasis on patient safety and patient experience, the implementation of quality improvement projects must be based on actual needs rather than merely spontaneous initiatives. Before applying, hospital departments often proposed improvement initiatives based on individual ideas. While some ideas delivered positive results, overall, many projects did not fully reflect the issues patients were facing.

This led to several consequences: Some projects did not impact on the quality of services provided to patients directly; it was difficult to demonstrate the connection between project outcomes and patient benefits; and patients had not truly become the central focus of improvement efforts.

To address these limitations, the hospital developed a standardised Risk Library. This library was built based on data collected from multiple sources:

- Medical incident reports (incident reporting system)
- Quality indicators (KPIs) such as hospital-acquired infection rates, readmission rates, and fall rates
- Patient satisfaction surveys and feedback
- Results of internal and external quality assessments

When proposing improvement projects, departments are required to select a risk from this library as the starting point. This ensures that every project is directly linked to issues that patients are experiencing.

Results and Impact:

- Over 90% of improvement projects in the first year of implementation were developed based on risks identified in the library.
- Projects focused on areas directly influencing patient safety and experience, such as reducing falls, improving waiting times, and increasing hand hygiene compliance.
- Patient satisfaction surveys after implementing improvement projects showed a 100% satisfaction rate (as of May 2025), according to an independent survey by the Ho Chi Minh City Department of Health.
- Patients reported feeling a stronger sense of the hospital's commitment to addressing issues that directly affect the quality of care.

2. Effective Leadership

One of the major limitations of the previous system was the lack of leadership involvement in guiding and managing quality improvement. Projects primarily relied on the voluntary efforts of departments, with no formal mechanism for oversight or encouragement from hospital leadership.

The Board of Directors and the Quality Council demonstrated leadership through the following actions:

- Strategic direction: requiring all improvement projects to originate from the risk library and department's priority issues
- Establishing a centralised improvement project management system: an electronic platform combining Microsoft Lists and Power BI dashboards to create multiple reports for different audiences (hospital leadership, department leadership, staff, functional department, etc) in a user- friendly manner (Appendix A)
- Transparency of information: leadership can monitor the progress and results of each project and make this information available for other departments to review
- Recognition and motivation: departments with successful projects are acknowledged rewarded and invited to share their experiences in hospital – wide quality meetings.

Results

- The proportion of departments with at least one improvement project increased from 60% (in 2023) to 90% (in 2025)
- High – performing projects all had active participation and close monitoring from leadership
- The leadership culture shifted from "reactive response" to "proactive guidance
- 100% of stakeholder provided feedback on improvement projects related to their activities

3. Continuous Improvement

Previously, many improvement projects were implemented but lacked proper monitoring and sustainability, resulting in a "tick- the – box" approach without long term results.

Implementing a centralised management system to track the progress and outcomes of each project over time. Applying the PDCA (Plan – Do – Check – Act) cycle to all projects. Establishing a quarterly review mechanism to assess sustainability and require additional improvement measures if necessary

Results

- 90% of initially registered improvement projects were implemented and completed on schedule.
- Over 70% of projects continued to be maintained in subsequent years, with some projects becoming standardised hospital processes.
- Several departments proactively proposed new improvements based on data from the system, demonstrating the emergence of a culture of continuous improvement

4. Evidence of Outcomes

Quantitative Results

- The number of hospital-wide improvement projects increased from 20 projects per year (before implementation) to 29 projects per year (after implementation)

- 90% of projects were directly linked to risks identified in the risk library.
- Over 90% of projects were completed on schedule, and 70% of those have been sustained.
- Patient satisfaction reached 100%, according to the survey conducted by the Ho Chi Minh City Department of Health (May 2025).
- Healthcare staff have developed a stronger awareness of the importance of data in quality improvement.
- Successful projects have been shared internally as a form of cross-departmental learning.
- A culture of continuous improvement has been established, based on evidence, with an approach that is inclusive and user friendly for diverse stakeholders.

5. Striving for Best Practice

The data-driven improvement management model has become a standard best practice within the hospital. Key highlights:

- All projects are based on standardised risk data.
- A transparent system is in place for management, monitoring, reporting, and evaluation.
- Staff are encouraged to participate and maintain continuous improvement

The development model is based on management concepts to optimised resources, therefore:

- Departments can refer to projects from other units to learn and replicate best practices
- Beyond the hospital level risk register, the scope can be expanded to include department – level risk registers.

In summary, implementing the data-driven improvement management model has created a comprehensive transformation:

- Placing patients at the center by addressing risks that directly impact safety and experience.
- Engaging leadership in providing direction and fostering a culture of quality improvement.
- Establishing a continuous improvement mechanism to ensure sustainable results.
- Providing clear evidence of improvement effectiveness through data.
- Setting a best practice that can be scaled across the healthcare system.

This model demonstrates the value of data-driven decision-making and promises to become a standard for quality improvement activities in the future.

INNOVATION IN PRACTICE AND PROCESS

The "Data-Driven Improvement Management" project represents a significant innovation in approach, implementation methodology, and its impact on organisational culture. This is the first time the hospital has adopted a systematic quality improvement model guided by data rather than relying on spontaneous initiatives.

First, the most notable innovation is the development of a standardised risk library. This library was created based on the aggregation and analysis of data from multiple sources: medical incident reports, quality indicators, patient experience surveys, and internal audit results. Standardising and making the library accessible provides a transparent and unified foundation for the entire hospital, ensuring that improvement projects originate from specific risk issues backed by clear data. This marks a breakthrough in risk management and quality improvement.

Second, the project brought about a fundamental shift in the approach: from a system based on individual ideas, lacking direction, to a data-driven improvement mechanism. With the risk library in place, departments have a solid basis for prioritisation, enabling them to design improvement projects that are appropriate and have clearly defined objectives. This ensures a systematic approach and strengthens alignment between each department's improvement activities and the hospital's overall goals for safety and quality.

Third, the project integrated a centralised improvement project management tool. This tool not only allows for project registration and record keeping but also tracks progress, evaluates outcomes, and analyses trends over time. As a result, the hospital can quickly identify successful projects for scaling and detect struggling projects

early to provide support or adjustments. This system creates a transparent mechanism, enabling leadership, departments, and staff to easily access information while fostering accountability.

Finally, one of the project's most important innovations is the establishment of a culture of data-driven decision-making throughout the hospital. Beyond a tool or a process, the project has contributed to a mindset shift among staff at all levels—from management to clinical personnel. Instead of launching projects based on trends or intuition, all improvement decisions are now grounded in evidence-based data. This not only enhances the sustainability of improvement efforts but also builds trust in a modern quality management system.

APPLICABILITY TO OTHER SETTINGS

The "Data-Driven Improvement Management" model not only delivers effectiveness within a single hospital but also offers high flexibility and broad applicability across various healthcare settings. The core of the model lies in using data to guide improvement activities, enabling any healthcare facility seeking to enhance service quality to adopt it.

First, the development of a risk library can be customised to the specific characteristics of each unit. Each hospital or department can collect and categorise risks based on its actual data, including incident reports, clinical indicators, patient feedback, or audit results. Standardising this data into a dedicated risk library provides a scientific and objective foundation for guiding improvement efforts.

Second, the model can be implemented at different levels of technological sophistication. In facilities with limited resources, the improvement project management system can operate simply using Excel or internal spreadsheets. In hospitals with more advanced technology infrastructure, the management tool can be integrated into internal software, electronic medical record (EMR) systems, or data analytics platforms such as Power BI. This flexibility ensures the model is not constrained by resource availability and can remain effective across various scales.

Third, the model can be scaled across an entire hospital system or healthcare network. When applied at the corporate level, each hospital can develop its own risk library, while a centralised management system at the network level enables benchmarking, comparison, and mutual learning. This not only promotes quality alignment but also creates opportunities for sharing best practices, thereby enhancing overall system capabilities.

Finally, the flexibility in scope of application is another key advantage. The model can be implemented at multiple levels:

- Department level: Direct improvement projects based on the specific risks of each unit.
- Hospital level: Manage and oversee all improvement activities, ensuring alignment with strategic objectives.
- Healthcare group or system level: Standardise processes, benchmark performance across facilities, and promote inter-organisational learning.

In summary, the data-driven improvement management model offers high applicability thanks to its ability to adapt to specific characteristics, its technological flexibility, and its suitability across multiple organisational levels. This is a sustainable solution with the potential to become a best practice in healthcare quality management—not only within a single hospital but also on a larger scale—contributing to improved quality and safety throughout the healthcare system.

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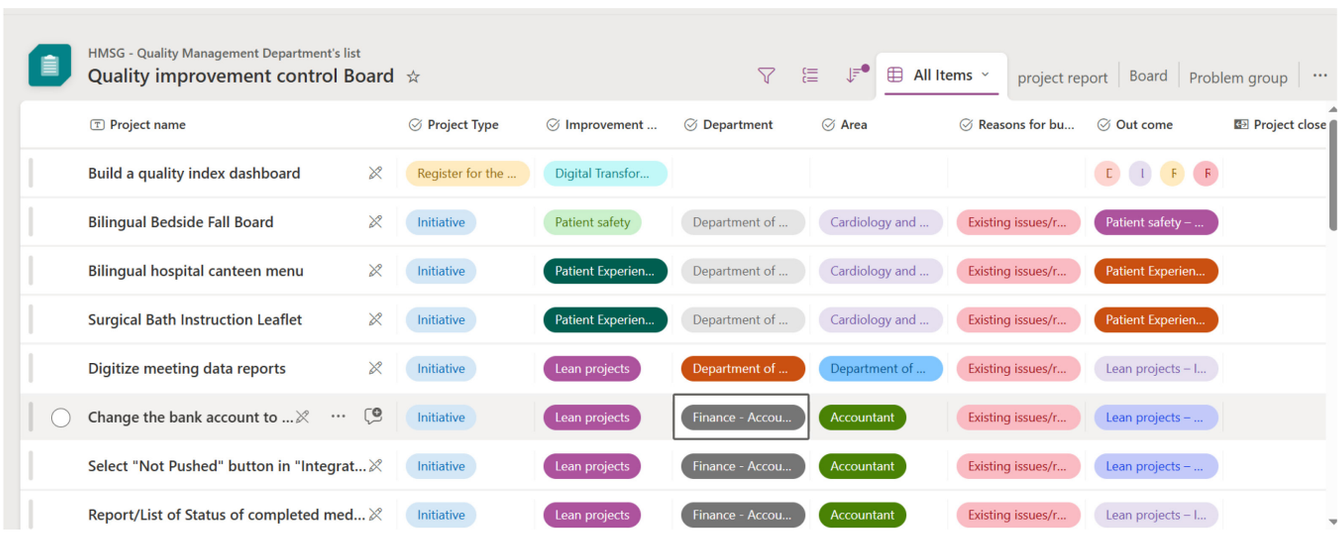
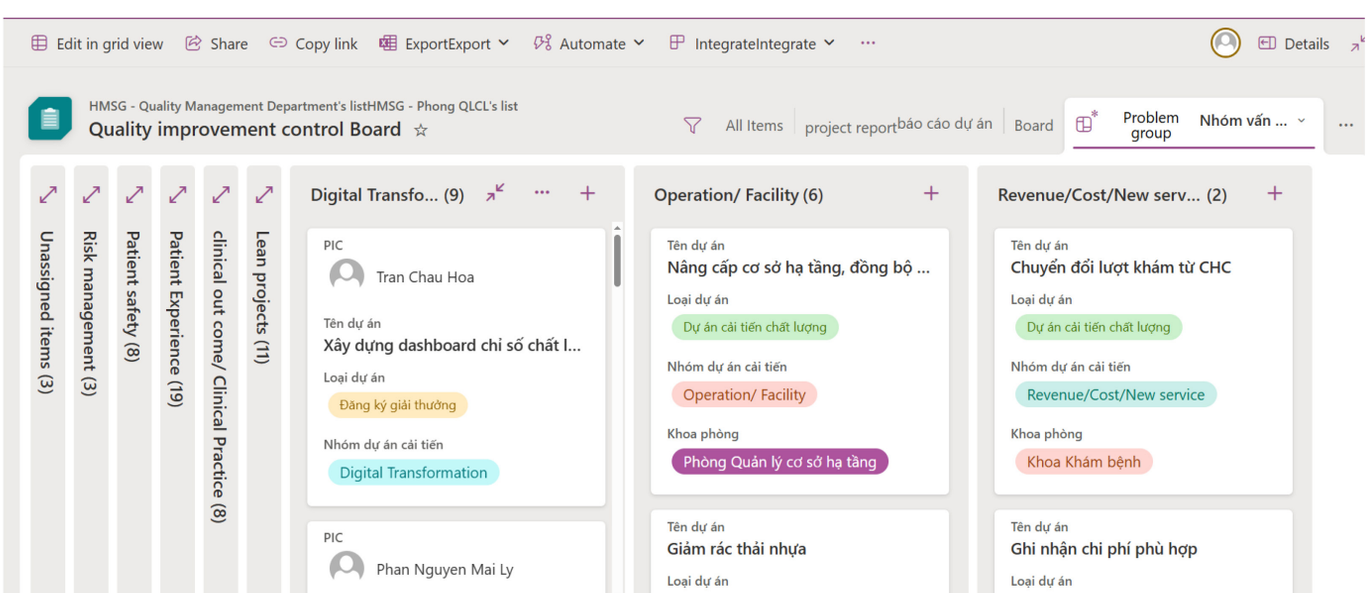
APPENDIX

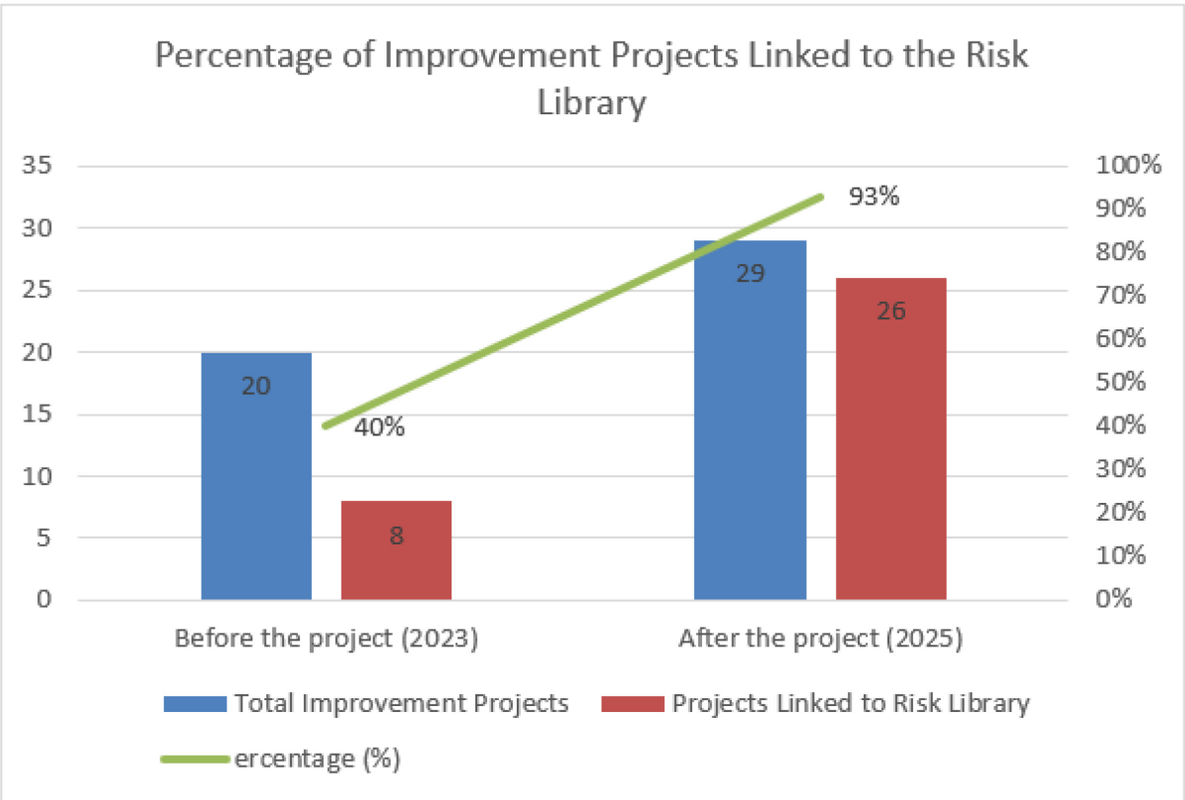
Appendix A: Quality improvement control board with improvement initiative and project





Appendix B: Improvement Projects Linked to Risk Library (Before vs. After Implementation)

Time Period	Total Improvement Projects	Projects Linked to Risk Library	Percentage (%)
Before the project (2023)	20	8	40%
After the project (2025)	29	26	93%



HEALTHCARE MEASUREMENT

TABLE OF SUBMISSIONS

Hoan My Sai Gon Hospital, VIETNAM

Data-driven Quality Improvement: Establishing a Healthcare Measurement System through Risk Library and Centralised Management to Enhance Patient Safety and Care Quality

Mr. Tran Chau Hoa, Ms. Do Thi Trang and Ms. Bui Ngoc Chau

Hong Kong Baptist Hospital, HONG KONG SAR

Effectiveness of Implemented Measures in Enhancing Allopurinol Safety and Preventing Drug-Induced Injury

Mr Leon Wai Li

Mouwasat Hospital Jubail, SAUDI ARABIA

Quality & Patient Safety Department

Improving Safety, Quality and Efficiency of Care Through the Development of a Patient Reported Outcome Measures (PROMS)

Dr. Samer Abdu, Dr. Heraa Zarea, Mis Mariam Zanati, Dr. Hytham Mousa, Eden Lapizar, Mary Ann Bathan and Mr. Mohamed A. El-Nabarawy

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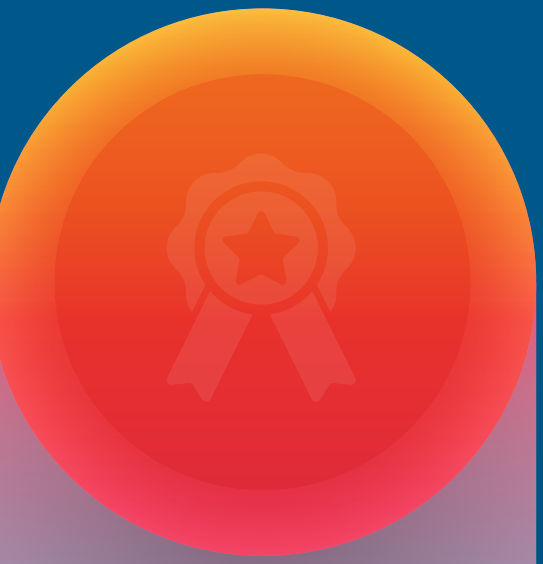

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QI QUALITY IMPROVEMENT AWARDS

Quality Initiatives – Entries in the 28th Annual ACHS Quality Improvement Awards 2025.

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CONTENTS

Introduction

The 28th Annual ACHS Quality Improvement Awards 2025

The annual ACHS Quality Improvement (QI) Awards were introduced in 1997 to acknowledge and encourage outstanding quality improvement activities, programs or strategies that have been implemented in healthcare organisations.

In 2025, the 28th Annual ACHS QI Awards were open to submissions from all domestic ACHS and international ACHSI member organisations following the ACHS NSQHS (National Safety and Quality Health Service) Standards Program, EQuIP6 (Evaluation and Quality Improvement Program), Standards Program, EQuIP6 Day Procedure Centres, EQuIP6 Oral Health Services, EQuIP6 Haemodialysis Centres, EQuIP6 Aged Care Services, EQuIP6 Healthcare Support Services, and the ACHS Clinical Indicator Program.

Judging was conducted externally with separate panels of three or four judges for each of the QI Awards categories -

Clinical Excellence and Patient Safety:

This category recognises innovation and demonstrated quality improvement in the delivery of safe, effective patient care.

Sustainable Healthcare and Service Delivery:

This category acknowledges demonstrated outcomes in non-clinical service delivery, improvement and innovation in sustainable healthcare, environmental sustainability, patient and/or consumer services, and organisation-wide practice. This includes services provided by community and allied health. This category was previously named 'Non-Clinical Service Delivery'.

Healthcare Measurement:

This category recognises organisations that have measured an aspect of clinical management and/or outcome of care, taken appropriate action in response to that measurement, and demonstrated improved patient care and organisational performance upon further measurement. Healthcare measurement can include data collected from the ACHS Clinical Indicator program or other methods of monitoring patient care processes or outcomes. Both quantitative and qualitative data can be used, however this category must describe the initial measurement, the analysis of that measurement, the action(s) implemented, and the improved measurement(s).

Each judging panel consisted of an ACHS Councillor, an ACHS Assessor, and a representative from an ACHS member organisation.

Submissions were required to meet specific criteria that were weighted equally:

- Judges assessed all eligible submissions on the five (5) ACHS principles of: consumer focus, effective leadership, continuous improvement, evidence of outcomes and best practice
- Judges assessed additional criteria: improvement in patient safety and care, measured outcomes, applicability in other settings, innovation in patient care and/or processes and relevance to the QI Awards category
- The submission MUST relate to a period of up to no more than two (2) years prior to the year of entry.

Each winning submission in the ACHS QI Awards receives a Certificate of Acknowledgement, a QI Awards trophy and a cash prize provided by ACHS.

ACHS publishes submissions from all participating organisations to share and encourage exceptional quality improvement strategies amongst the ACHS member organisations.

The electronic version of this document will be published on the ACHS website (www.achs.org.au).

Winner Submissions by Category

The 28th Annual ACHS Quality Improvement Awards 2025

CLINICAL EXCELLENCE AND PATIENT SAFETY

Hunter New England Local Health District (HNELHD), NSW

Centre for Psychotherapy, Hunter New England Mental Health Service

TIATRA: Telehealth Increased Access to Treatment in Rural Areas for people with Borderline Personality Disorder

Dr Carla Walton, Sharleen Gonzalez, Dr Katie McGill, Naz McGregor, Anna Dunbar, and Richard Brimson

Full submission page 7

SUSTAINABLE HEALTHCARE AND SERVICE DELIVERY

Eastern Health, VIC

Support Services

Improving food service safety and food waste in Emergency and Short Stay Departments

Warwick Millard

Full submission page 49

HEALTHCARE MEASUREMENT

Hunter New England Local Health District (HNELHD), NSW

Population Health

Healthy Beginnings for HNE Kids: from pilot to HNE-wide scale-up

A/Prof Rachel Sutherland, Prof Luke Wolfenden, Nayerra Hudson, Dr Alison Brown, Dr Jacklyn Jackson, Jessica Pinfold, Christophe Lecathelinais, Dr Paul Craven, Sinead Redman, Susan Darby, Tauri Smart, and Fiona Murphy

Full submission page 71

Highly Commended Submissions by Category

The 28th Annual ACHS Quality Improvement Awards 2025

CLINICAL EXCELLENCE AND PATIENT SAFETY

Metro North HHS Surgical Treatment and Rehabilitation Services (STARS), QLD

Ambulatory Care Services, Post Operative Discharge Support Service (PODSS)

Revolutionising Post Operative Care with PODSS

Kara Gadischke, Rebecca Pickering, Jane Holt, and Melanie Ullner

Perth Children's Hospital, WA

Respiratory Medicine

Year of the Frog: A campaign to address the challenges of regular sputum surveillance for children with cystic fibrosis

Crystal Bourke, Julie Depiazzi, Noula Gibson, Laura Cinanni, Jizelle Kenworthy-Groen, Eloise Connell, Alison Stone, Charlotte Burr, Andre Schultz, and David Hancock

SUSTAINABLE HEALTHCARE AND SERVICE DELIVERY

Hunter New England Local Health District (HNELHD), NSW

Critical Care Services, John Hunter Hospital

Risk Assess for Success Gloves off / Gown off

Aditee Parab and Nikhil Kumar

National Critical Care and Trauma Response Centre (NCCTRC), NT

Disaster Preparedness and Response/Laboratory

Strengthening Laboratory Capability for Emergency Health Response: Quality Improvements within the National Critical Care and Trauma Response Centre (NCCTRC) / Australian Medical Assistance Team (AUSMAT) Laboratory

Leanne Jones

Highly Commended Submissions by Category

The 28th Annual ACHS Quality Improvement Awards 2025

HEALTHCARE MEASUREMENT

Eastern Health, VIC

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Blood Component Data and Informatics

Petra Spiteri

Hunter New England Local Health District (HNELHD), NSW

Supportive Care for Chronic Disease

Mind & Matter: psychiatry in chronic disease

Troy Arnold, Laureate Prof John Attia, Lauren Johnson, Prof Brian Kelly AM, Sarah Pullen, Dr Shalini Rajan, Dr Sharon Ryan, and Prof Katie Wynne

CLINICAL EXCELLENCE AND PATIENT SAFETY

WINNER

Hunter New England Local Health District (HNELHD), NSW

Centre for Psychotherapy, Hunter New England Mental Health Service

TIATRA: Telehealth Increased Access to Treatment in Rural Areas for people with Borderline Personality Disorder

Dr Carla Walton, Sharleen Gonzalez, Dr Katie McGill, Naz McGregor, Anna Dunbar, and Richard Brimson

AIM

The Telehealth Increased Access to Treatment in Rural Areas for Borderline Personality Disorder (TIATRA) project aimed to increase access to evidence-based Dialectical Behaviour Therapy (DBT) for people with Borderline Personality Disorder (BPD) living in rural areas. It sought to develop and evaluate a hybrid telehealth model combining remote virtual skills group therapy with locally delivered individual therapy by rural clinicians. The project aimed to improve clinical outcomes for consumers while building capacity and confidence among rural health professionals. Ultimately, it intended to create a sustainable, scalable approach to reduce treatment inequities in underserved rural communities.

SUMMARY ABSTRACT

Addressing limited access to a best practice mental health treatment in rural areas

The Telehealth Increased Access to Treatment in Rural Areas for Borderline Personality Disorder (TIATRA) project was developed through a collaborative research partnership between Hunter New England (HNE) and Murrumbidgee Local Health Districts (LHDs) with the aim of increasing access to Dialectical Behaviour Therapy (DBT) for individuals diagnosed with Borderline Personality Disorder (BPD) living in rural areas. BPD is a severe mental disorder characterised by high instability in affect, identity and interpersonal relationships (Bohus et al., 2021). It is associated with profound suffering for individuals and impaired quality of life as well as significant health care use and costs (Soeteman et al., 2008; van Asselt et al., 2007). While DBT is the most evidence-supported treatment for BPD (Bohus et al., 2021), its resource-intensive nature makes it difficult to consistently deliver in rural community health settings (Walton et al., 2025). To address this, TIATRA trialled a hybrid service delivery model that combined telehealth-delivered skills group therapy run by clinicians with expertise in DBT, alongside individual therapy provided by rural community clinicians. This model was designed to overcome longstanding geographical and resourcing barriers to care for this underserved population. The background to TIATRA and the overall model is outlined in Walton et al (2025; see Appendix A)

TIATRA outcomes

The pilot demonstrated that this hybrid delivery approach was both feasible and acceptable to consumers, clinicians, and managers. Consumers reported the program as a positive, often life-changing experience that substantially improved their quality of life. Clinicians reported increased skills, confidence, and capacity to treat people with BPD, and managers noted these improvements as well as positive clinical outcomes. Importantly, telehealth delivery was broadly accepted with minimal issues, demonstrating its suitability for rural settings. The program also fostered collaboration between metropolitan expert clinicians and rural clinicians, supporting skills development and building local leadership and autonomy.

Quantitative outcomes demonstrated significant clinical improvements across multiple measures. For consumer participants (n=19), there was a complete cessation of suicide attempts in the four months post-treatment, significant reductions in BPD symptom severity (from an average BPDSI score of 40.67 to 24.93), reduction in non-suicidal self-injury episodes (from 51.89 to 1.67), disability scores, depression scores, and alcohol/substance use.

Consumer and clinician ratings indicated high levels of acceptability and feasibility. Clinician confidence (n=12) increased markedly, with the proportion who were very confident rising from 0% at baseline to 39% post-treatment. Moreover, psychiatric inpatient admissions and emergency department presentations dropped substantially from 83 in the twelve months prior to treatment to 37 in the year of treatment, highlighting potential health system savings.

Health economic analyses conducted as part of the pilot demonstrated that the model is financially viable, with prevention of approximately one hospital admission per consumer per year sufficient to offset program costs. Implementation costs for the first year were $279,646 AUD, with ongoing costs estimated at $188,798 AUD annually. The program's impact extended beyond those directly treated, as trained rural clinicians applied their newly acquired DBT skills to other consumers in their caseloads, improving broader community mental health care and enhancing clinician retention.

ACHS Principles in action

The TIATRA project emphasized consumer focus and engagement throughout its lifecycle. Two lived experience representatives were part of the research team, ensuring consumer perspectives guided program adaptations and service delivery. Consumer consultation was integral to designing a program that was responsive and culturally appropriate for rural communities. Respectful collaboration among all stakeholders—consumers, clinicians, managers, and lived experience advocates—was foundational to the program's success.

Leadership throughout the project was characterised by collaboration, empowerment, and respect. Metropolitan DBT experts supported rural clinicians without overshadowing their leadership, building local capacity and confidence. The project team demonstrated a commitment to continuous learning and innovation, incorporating feedback and adapting processes in real time. This flexible and respectful leadership approach fostered motivation and ownership among clinicians and stakeholders.

Continuous quality improvement was embedded as a core principle. The team actively sought opportunities to refine the model based on participant feedback and outcome data. The pilot's success has led to mental health executives endorsing the program's continuation and integration into routine service delivery in the rural districts involved.

Scalability and Innovation

While the TIATRA project was originally limited to two LHDs with similar rural and metropolitan challenges, its design inherently allows for scalability and adaptability across other rural and remote regions in New South Wales and Australia more broadly. The evidence generated supports the model as a promising approach to reduce inequities in access to evidence-based DBT care for people with BPD living outside metropolitan centres. Expansion opportunities include partnering with other rural health services and adapting the hybrid telehealth delivery model to local community needs.

TIATRA exemplifies an innovative approach to mental health service delivery by leveraging telehealth technology to overcome longstanding rural access barriers. The model pools multiple smaller rural sites to form a networked team capable of delivering evidence-based therapy with adequate clinical caseloads. It combines the strengths of metropolitan specialist expertise with local community knowledge and care, ensuring both clinical quality and cultural fit.

Key Message

The TIATRA project has demonstrated that hybrid telehealth models for DBT are feasible, acceptable, clinically effective, and economically viable for rural populations. It represents a significant step toward addressing rural mental health disparities, empowering rural clinicians, and improving consumer outcomes for a clinical population that experiences high degree of suffering and for which clinicians often find challenging to work with. Continued support, refinement, and scaling of this innovative model hold promise for broader implementation and lasting impact across rural health systems.

REPORT

APPLICATION OF ACHS PRINCIPLES

1. Consumer Focus

The TIATRA program was designed with a strong consumer focus, grounded in the principle that individuals living in rural and remote areas should have equitable access to evidence-based psychological treatment. This project specifically responded to the unmet needs of people living with BPD, a population that is often marginalised and underserved in rural mental health care settings. Consumers were involved throughout the lifecycle of the project—from initial needs assessment and service design, through to delivery, evaluation, and ongoing feedback.

Lived experience leadership
Two members of the research team, Ms Naz McGregor and Mr Richard Brimson, live with BPD in different rural locations within each of the participating health districts. These team members attended the monthly project meeting and participated in review of project progress, identification of arising problems and scoping of potential solutions, and interpretation of results and findings. These team members both had lived experience not only of the condition of interest but also the challenges of accessing best practice treatment (including DBT) within a rural area. Naz and Rich brought not only their perspective on what they felt may contribute or help to address arising problems, they were also able to highlight what they felt should be a priority for the project in an ongoing way and reminded and centred our ways of working as a team around being people first.

Model designed to enhance consumer access to best practice care
During the planning phase, insights from both consumers and rural clinicians highlighted the urgent need for consistent, accessible DBT services. Consumers reported long-standing barriers to care including geographic isolation, stigma within tight-knit communities, and the absence of local clinicians trained in DBT. This led to the development of a hybrid model that offered weekly skills groups delivered via telehealth alongside local providing individual face-to-face therapy when possible (or utilising telehealth as needed). This model was designed to respect both consumer preferences for anonymity and continuity of care, and to foster therapeutic relationships through face-to-face interactions where feasible.

Treatment delivery tailored to fit consumer needs
Throughout implementation, the project team remained responsive to consumer feedback. Practical changes were made based on participant input, such as adjusting session times and addressing early technical difficulties with telehealth. Consumers expressed appreciation for the format of the program, particularly the privacy and convenience afforded by virtual group sessions. Importantly, the model was co-designed in a way that preserved fidelity to standard DBT while adapting for local realities and workforce limitations.

Consumer experience
As outlined in the Evidence of outcomes section, evaluation of the pilot used both quantitative and qualitative data to explore the impact of the program. Consumers talked about participation in the TIATRA program as being positive, for some, a "life changing" experience, with many reporting significant improvements in their quality of life. They described the model as effective, meaningful, and accessible, even in its hybrid format. Consumers also appreciated receiving care from clinicians who understood the rural context, whether they were based locally or partnered from metropolitan centres. All consumer participants expressed a desire for the program to continue running in their region. Standardised outcome measures confirmed consumers' description of the impact of the program with significant reductions in suicide attempts, BPD symptom severity and significant improvements in quality of life and depression.

Key message
The feedback and outcome data collectively demonstrate that the TIATRA model not only delivered clinically significant benefits but did so in a way that was meaningful and acceptable to the people it aimed to serve. Consumers felt seen, heard, and supported—often for the first time in their experience with mental health services. Their feedback directly shaped the design and ongoing delivery of the program, and with people with lived experience of BPD as part of the research team, we sought to ensure that consumer priorities remained central throughout the project.

2. Effective Leadership

Effective leadership in the TIATRA project was characterised by a strong commitment to collaboration, respect, and empowerment across all levels of the program.

This was demonstrated in five key ways:

- The team developed an innovative solution to a known problem, specifically challenges in accessing best practice treatment for BPD within rural areas, through use of technology and partnerships between metro and rural units.
- Taking a collaborative approach across two health districts to examine the potential for this model of service delivery, as a means of making best use of existing resources and exploring the capacity for this model to work in different areas.
- Using a robust research approach to explore the feasibility of this sort of service delivery model, to ensure confidence in the conclusions.
- Having people with lived experience be equal members of the research team, including remuneration for their time and contribution.
- Walking the talk on partnerships, which required connection and commitment from multiple stakeholders from frontline clinicians to managers to Mental Health Service Executive to specialist DBT clinicians to consumers and people with lived experience.

Leadership through partnerships
From the outset, leadership fostered close partnerships between trainers, clinicians, and managers to co-design and implement the program within Hunter New England and Murrumbidgee LHDs. This ongoing collaboration extended beyond local teams to include DBT experts from a specialist service for the treatment of Borderline Personality Disorder, Centre for Psychotherapy based in Newcastle, who provided training for all clinicians and who facilitated skills training groups and participated in the consultation team for Hunter New England. A leader from Murrumbidgee Local Health District was the lead for the project in that LHD. These experts provided comprehensive guidance and support while encouraging rural clinicians to develop confidence and leadership in their own practice.

Lived experience partnership
Central to the leadership approach was the meaningful involvement of lived experience representatives and consumers, ensuring that the voices of those the program was designed to serve remained integral to decision-making and service adaptation. The team demonstrated humility and openness, evidenced by responding constructively to feedback from lived experience partners—such as recognising the importance of starting meetings by checking in on each other's wellbeing, fostering a culture of respect and human connection before engaging in project tasks.

Tailoring to fit local needs
Leaders respected and valued the local expertise of rural clinicians, managers, and consumers, actively implementing their suggestions to adapt the DBT program to be fit-for-purpose in rural settings. This inclusive approach promoted ownership and relevance, enhancing the program's acceptability and feasibility.

Empowering clinicians
A key leadership focus was empowering clinicians in the rural areas to deliver evidence-based DBT with increased confidence and skill. This goal was achieved, with clinicians reporting not only improved competence in treating people with BPD but also applying DBT principles and skills across their broader clinical caseloads. Given the stigma often faced by people with BPD, leadership's emphasis on empowerment aligned closely with DBT's core mission—to help individuals build meaningful, fulfilling lives by understanding their diagnosis and learning to self-manage emotional regulation and independence.

Middle management support
Moreover, leadership maintained a strong commitment to innovation by developing and sustaining a hybrid model of service delivery that combined telehealth with local face-to-face therapy, addressing rural workforce challenges and service accessibility. Leaders encouraged ongoing professional development through weekly

online consultation meetings, fostering a culture of continuous learning and peer support that reduced clinician isolation and enhanced service quality.

Key message
In summary, leadership in the TIATRA project was instrumental in setting strategic direction, inspiring and motivating the workforce, embracing innovation, and fostering respectful partnerships. This approach ensured that the program not only delivered high-quality, evidence-based care but also remained responsive to the needs of rural consumers and clinicians, driving sustainable improvements in rural mental health service delivery.

3. Continuous Improvement

The TIATRA project exemplifies a strong commitment to continuous improvement, with the research team dedicated to developing a sustainable program that benefits future consumers and supports ongoing workforce development. From the outset, the program encouraged appropriate and collaborative adaptations to ensure the DBT model remained responsive and tailored to the unique needs of consumers, clinicians, and managers in rural settings. Lived experience representatives were an integral part of the research team, providing valuable consumer perspectives throughout the active stages of the project, ensuring that continuous improvement was grounded in lived experience.

Throughout the pilot phase, management and clinicians consistently sought to enhance the quality of care by actively monitoring outcomes and gathering feedback from consumers and clinicians alike. This feedback was instrumental in identifying modifications that would support the model's sustainability and integration into routine care beyond the pilot period. The high-quality DBT training delivered to rural clinicians resulted in increased confidence, skill, and competence in treating this complex and high-risk population.

The program's success was further validated when the mental health executive endorsed its continuation beyond the pilot phase, demonstrating organisational commitment to sustaining quality care. Importantly, the program addressed a population often seen in health services for extended periods without significant improvement, thereby reducing demand on hospitals and associated financial costs.

The TIATRA team fostered a culture of reflective practice and peer support through regular consultation meetings, providing clinicians with ongoing opportunities for professional development and collaborative problem-solving. The two leads from each health district attended consultation meetings to get feedback from clinicians. The project team met monthly to review progress and problem solve any issues. This continuous engagement helped maintain high standards of care while allowing flexibility to adapt to evolving consumer and workforce needs.

In summary, the TIATRA project integrates continuous improvement as a core principle by embedding evaluation, consumer input, workforce development, and adaptive strategies into everyday practice, thereby ensuring the ongoing delivery of high-quality, consumer-centred mental health care in rural communities.

4. Evidence of Outcomes

A robust research frame was used to understand the feasibility, acceptability and impact of this model of service delivery. This was possible through funding through the Peregrine Centre- NSW Health Rural Mental Health Partnership scheme, which allowed for
support by statisticians and health economists from Hunter Medical Research Institute to deliver critical data demonstrating the program's effectiveness, efficiency, and positive impact on consumer outcomes and health service performance. The pilot's comprehensive evaluation included health economic analyses that highlighted improvements in productivity and financial efficiency across multiple metrics, reflecting a strong commitment to maintaining quality and striving for ongoing improvement.

Consumer outcomes
Both qualitative and quantitative approaches were used to understand the impact of the program. Consumer outcomes (n=19) showed significant clinical improvements. At baseline, the average number of suicide attempts in the past four months was 0.78 (SD = 1.99); at post-treatment, no suicide attempts were reported. Non-suicidal self-injury episodes decreased dramatically from an average of 51.89 (SD = 53.89) to 1.67 (SD = 4.64), a statistically

significant reduction (t(8) = 2.79, p = .024). BPD symptom severity decreased from a baseline score of 40.67 (SD = 11.5) to 24.93 (SD = 9.31) post-treatment.

Further improvements were seen across key secondary outcomes. Consumers reported a significant reduction in their top three self-identified problems, with each problem's severity decreasing markedly from baseline to post-treatment (all p-values < .002). Disability scores, measured by WHODAS, decreased significantly, as did depression scores (BDI-II), which dropped from a mean of 41.5 to 11.25 (p < .001). Quality of life, measured by ReQOL, improved significantly from 12.25 to 23.88 (p = .016), and reductions in alcohol and substance use (ASSIST) scores were also statistically significant.

Furthermore, the program demonstrated clear non-inferiority to specialised face-to-face Dialectical Behaviour Therapy (DBT) in reducing depressive symptoms, measured by the Beck Depression Inventory (BDI-II). For Borderline Personality Disorder symptom severity (BPDSI), results indicated non-inferiority based on established clinical thresholds, although larger sample sizes are needed for more definitive conclusions regarding BPD-specific outcomes. These findings suggest that telehealth-delivered DBT, supported by rural clinicians, is a viable alternative to traditional specialist care, particularly in addressing depression in rural populations.

Clinician outcomes
Clinician outcomes were equally positive (n=12), with confidence levels markedly increasing. At baseline, only 53% of clinicians felt moderately confident, with 8% not confident at all; post-training, 61% reported moderate confidence and 39% felt very confident in delivering DBT. Both consumers and clinicians rated the program as highly acceptable (average scores above 4.4/5 and 4.5/5, respectively) and feasible (average scores above 4.3/5 and 4/5, respectively) across all timepoints, underscoring the program's relevance and usability in rural settings.

Service outcomes
From a system perspective, the TIATRA model led to a substantial reduction in psychiatric inpatient admissions and emergency department presentations, declining from 83 presentations in the 12 months prior to treatment to 37 presentations during the treatment year. Economic evaluation revealed that the total implementation costs for the first year were $279,646 AUD, with ongoing annual costs estimated at approximately $188,798 AUD. The analysis further indicated that preventing just one hospital admission per consumer per year would offset the program costs across various rural remoteness classifications, highlighting the financial sustainability and value of the model.

Qualitative insights reinforced these quantitative findings, with clinicians reporting increased job satisfaction and retention attributed to their involvement in the program. Many clinicians noted that their enhanced DBT skills were being applied beyond the TIATRA consumer group, thereby elevating the quality of care across their broader caseload. Additionally, the program fostered improved clinical support and collaboration among rural health sectors, contributing to stronger workforce cohesion and service integration.

Key message
Together, these outcomes provide compelling evidence that the TIATRA program not only improves consumer health and quality of life but also enhances operational performance and workforce capacity in rural mental health services, exemplifying a commitment to excellence and continuous improvement.

5. Striving for Best Practice

The concept underpinning this research project exemplifies the principle of striving for best practice by addressing critical gaps in access to evidence-based treatment for people with Borderline Personality Disorder (BPD) living in rural areas.

Designed to address a lack of access to best practice in rural areas
Dialectical Behaviour Therapy (DBT) has the most evidence of any psychotherapy for the treatment of BPD (Bohus, et al., 2021). There is extensive research showing that DBT leads to a reduction in suicidal behaviour and self-harm and hospital admissions as well as improvements in depression and quality of life (Miga et al., 2019). However, historically, consumers in rural regions have lacked equitable access to comprehensive DBT programs available in metropolitan centres (Proctor et al., 2021), creating a disparity in care quality. This project was designed to redress

that inequity by delivering high-quality, evidence-based treatment to rural consumers, thereby ensuring they receive care aligned with best-practice standards.

Designed to upskill rural clinicians in a best practice treatment
Furthermore, the project acknowledged the challenges faced by rural clinicians, who often have limited access to specialised training, supervision, and ongoing professional support. By prioritising the upskilling of rural clinicians through training, ongoing supervision, and collaborative consultation teams, the project not only enhanced workforce capacity but also contributed to raising the overall standard of care within rural mental health services. The impact of the project on clinicians' skills and confidence for working with BPD was demonstrated in significant improvements in clinicians' rating of confidence with a marked shift from 8% being not confident to 39% being very confident in managing this complex condition. Qualitative feedback from clinicians indicated that the skills and knowledge gained through the project enhanced their capacity to provide effective care not only to TIATRA participants but also to other consumers in their broader caseloads. These are quotes from 2 of the rural clinicians: "...I'm feeling a lot more comfortable in being able to give and provide DBT therapy to clients and have done so not just for the client for this program but elsewhere doing DBT-informed with many other clients, which has been really helpful. And seeing the changes has been fantastic" and "I think that's a worthwhile investment to have people doing work that they find satisfying and fulfilling. And I honestly think we've kept people Even aside from myself, we've kept clinicians in our health service locally, who may not have stayed if it weren't for doing DBT."

Lived experience leadership
The inclusion of lived experience representatives as co-design partners ensured that consumer perspectives actively shaped program adaptations and delivery methods, further grounding the project in best-practice principles.

Delivery of a best practice treatment with demonstrable improved consumer outcomes
Clinically, the project demonstrated substantial positive outcomes. Suicide attempts among consumers dropped from an average of 0.78 in the four months prior to treatment to zero post-treatment. BPD Disability levels also decreased (from mean of 37.78 to 30.13 on the WHODAS; $t(7) = 2.83$, $p<.05$), as did alcohol and substance use (from mean of 10.55 to 5.55 on the ASSIST; $t(10) = 3.22$, $p(.05)$, and depression scores (from 41.5 to 11.25 on BDI-II; $t(7) = 6.10$, $p<.05$).

A collaborative, innovative model of service delivery to increase access to best practice care
By incorporating innovative telehealth delivery and collaborative workforce models, learning from both metropolitan and rural expertise, and continuously adapting the program based on stakeholder feedback, this project reflects a commitment to adopting new techniques and technologies. It advances service delivery efficiency and effectiveness while improving consumer satisfaction and outcomes, exemplifying the organisation's dedication to achieving world-class, best-practice care in rural mental health.

INNOVATION IN PRACTICE AND PROCESS

TIATRA is innovative in a number of ways. We:

- Identified ways to maintain fidelity to the key features of DBT and areas where tailoring could allow the treatment to be delivered in a manner that was more feasible for rural areas.
- Used technology to reduce treatment resource demands so that it was possible for DBT to be made available in rural areas.
- Used partnerships between services/units to allow for access to specialist clinicians to support delivery of DBT by rural clinicians and to enable groups to be run over broad geographic areas.

Benefits of a telehealth approach for extending reach
The project sought to use technology to address long-standing access challenges in rural mental health care. Dialectical Behaviour Therapy (DBT) is an evidence-based treatment for Borderline Personality Disorder (BPD) traditionally delivered face-to-face, but it is too resource-intensive for rural health services to deliver consistently. In both the Hunter New England New England North West and Murrumbidgee Local Health Districts, previous face-to-face DBT programs were unsustainable due to resource constraints, leaving rural consumers without access to this effective care.

Historically, rural consumers had to relocate to metropolitan areas like Newcastle to access DBT, uprooting them from their communities and support systems. TIATRA's hybrid model, combining face-to-face individual therapy with telehealth-delivered skills groups, enables rural health services to provide evidence-based treatment while consumers remain connected to their communities. This approach addresses barriers such as travel costs, time, and social stigma.

Collaboration to upskill and increase viability
The project's innovation extends to its collaborative structure, pooling smaller rural sites to operate as a regional team. This facilitated clinician networking across sites and ensures online groups have enough participants for clinical and financial viability. Experienced DBT clinicians from the metropolitan Centre for Psychotherapy delivered the telehealth skills groups and provided ongoing mentorship to rural clinicians, building local expertise and confidence.

Consumer focus and contribution
Consumers reported benefits from telehealth groups including reduced transport barriers, increased anonymity in small communities, and lower social anxiety compared to face-to-face groups. The project incorporated co-design principles by involving lived experience representatives on the research team, ensuring consumer perspectives shaped program adaptations, enhancing acceptability and relevance.

Responding to emerging challenges
Challenges such as early technical difficulties were overcome with dedicated training and support. Initial clinician uncertainty about remote DBT delivery was addressed through ongoing mentorship and consultation teams. Workforce issues like high staff turnover and competing demands were recognised and mitigated by recommending new role descriptions and protected time for DBT-related work.

Key message
In summary, TIATRA innovatively integrates technology, cross-site collaboration, co-designed adaptations, and workforce development to deliver accessible, evidence-based DBT in rural settings. By overcoming geographic, technical, and workforce challenges, the project offers a sustainable and effective model to extend best-practice mental health care to underserved rural populations.

APPLICABILITY TO OTHER SETTINGS

The TIATRA project was purposefully designed with scalability and applicability to other settings in mind. Initially developed as a partnership between Hunter New England and Murrumbidgee Local Health Districts (LHDs)—two regions facing similar challenges in delivering labour-intensive, evidence-based treatments to people with BPD in rural areas—the project sought to create a model that could transcend regional boundaries. One of these districts included both metropolitan and rural communities, while the other was entirely rural, allowing the model to be tested across diverse rural contexts.

Relevant to rural areas
The difficulties encountered in providing consistent, high-quality care to consumers with BPD are not unique to Hunter New England and Murrumbidgee LHDs. Many other public health services in Australia, particularly those with significant rural and remote populations, share similar challenges related to workforce shortages, geographic isolation, and limited access to specialist services. Consequently, these regions stand to benefit from adopting a hybrid model like TIATRA that leverages telehealth technology alongside local clinician support to increase accessibility without compromising quality of care.

Through its successful implementation and rigorous evaluation, the project has generated preliminary evidence that the TIATRA model offers a feasible, acceptable, and effective approach to delivering DBT in underserved rural communities. The hybrid model—combining face-to-face individual therapy with telehealth-delivered group skills training—addresses key barriers such as travel distances, clinician capacity, and stigma associated with attending local group programs in small communities.

Importantly, the model's design is inherently adaptable to diverse rural and remote settings beyond the original health districts. The pooling of multiple small rural sites into a coordinated network facilitates a critical mass of participants for group therapy and encourages clinician collaboration across geographically dispersed areas. This

flexible approach could readily be tailored to suit the unique characteristics and resources of other regional health services across New South Wales and Australia more broadly.

Model for other mental health conditions
Future directions for applying the TIATRA model may also include adaptations to other populations who experience barriers to specialist psychological treatments due to geographic isolation or service limitations. Moreover, the strong integration of lived experience input and co-design principles within the project provides a replicable framework for consumer-centred service innovation in a variety of health service contexts.

Key message
In summary, the TIATRA project has laid the groundwork for a scalable, evidence-informed approach to improving rural mental health service delivery. With ongoing support and resourcing, this model holds significant promise for addressing longstanding inequities in access to high-quality care for people living with BPD and other complex mental health conditions in rural and remote communities across Australia.

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APPENDIX

Appendix 1

Australian Journal of Rural Health

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COMMENTARY OPEN ACCESS

Telehealth and Collaboratively Delivered Dialectical Behaviour Therapy: An Opportunity for Increasing Access to Effective Treatment for People With Borderline Personality Disorder Living in Rural Areas

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ABSTRACT

Aims: The aim of this commentary is to consider how telehealth and a collaborative model of service delivery may offer a way of making Dialectical Behaviour Therapy available in rural areas.

Context: Dialectical Behaviour Therapy (DBT) is an effective treatment for Borderline Personality Disorder (BPD). However, there are many barriers to making this sort of therapy available within routine care, particularly in rural areas.

Approach: This commentary provides a summary of the literature relevant to the role that telehealth could play in increasing access to DBT. A new model of care could utilise telehealth services to deliver comprehensive DBT treatment to people with BPD living in rural areas in partnership with community mental health services.

Conclusion: Telehealth and collaborative models of Dialectical Behaviour Therapy delivery should be further investigated, especially to meet the needs of rural mental health care.

1 | Background: Borderline Personality Disorder—An Underserved Clinical Population in Rural Areas

Borderline Personality Disorder (BPD) is a mental illness, characterised by chronic emotion dysregulation, self-injury and suicidal behaviour. Prevalence estimates suggest 1%–2% of the general population meet diagnostic criteria for BPD, 10% of psychiatric outpatients and 25% of inpatients meet diagnostic criteria for BPD [1, 2].

BPD is associated with high emotional, social and occupational burden and suffering for patients and their families [3]. There is high stigma associated with a BPD diagnosis [4]. Consumers living in rural areas have described feeling that they needed to hide their diagnosis and were reluctant to seek help due to community-based stigma [5]. Given the presence of self-injury and suicidal behaviour in this population, this understandable reluctance to seek support could be life threatening.

BPD is also one of the most expensive psychiatric disorders for health systems [6]. There is extensive use of treatment services with this population, requiring multiple repeated treatments, including urgent interventions in emergency departments for suicide attempts or self-injurious behaviour.

Despite the acuity and frequent contact, there are many studies showing that clinicians are reluctant to work with people with

CLINICAL EXCELLENCE AND PATIENT SAFETY

HIGHLY COMMENDED

Metro North HHS Surgical Treatment and Rehabilitation Services (STARS), QLD

Ambulatory Care Services, Post Operative Discharge Support Service (PODSS)

Revolutionising Post Operative Care with PODSS

Kara Gadischke, Rebecca Pickering, Jane Holt, and Melanie Ullner

AIM

The Post-Operative Discharge Support Service (PODSS) at the Surgical Treatment and Rehabilitation Service (STARS) was established to reduce unnecessary Emergency Department (ED) presentations and readmissions, improving patient safety and system efficiency. The model allows patients to call directly for advice and support from experienced nurses after discharge, while nurses also reach out to vulnerable cohorts to provide tailored education and follow-up. PODSS was developed in response to National Surgical Quality Improvement Program (NSQIP)-identified risks and continues to evolve through strong consumer feedback on post-operative support needs. By bridging the gap between hospital and community care, PODSS delivers safer, more responsive, and patient-centred recovery at home.

SUMMARY ABSTRACT

Introduction

The Post-Operative Discharge Support Service (PODSS) is a patient-centred program developed at the Surgical Treatment and Rehabilitation Service (STARS) to improve surgical safety, quality, and continuity of care. It was established in response to National Surgical Quality Improvement Program (NSQIP) data, which identified high rates of post-operative complications, unplanned readmissions, and Emergency Department (ED) presentations (Brown et al., 2021; Tyler et al., 2023). Clinicians recognised a gap between hospital discharge and outpatient follow-up, often described as a "black hole" in which patients had limited access to General Practitioners and relied on ED as their only option (Bavin, Tobiano & Gillespie, 2023; Kang et al., 2020a; Morley et al., 2018). PODSS was designed to bridge this gap by ensuring patients had timely access to the right care, in the right place (WHO, 2016; Clinical Excellence Queensland, 2024).

Background

PODSS was developed and implemented by a multidisciplinary team of surgeons, Clinical Nurse Consultants (CNCs), Surgical Clinical Reviewers, project officers, and executives to support patients for up to 30 days after surgery, addressing clinical concerns and providing post-operative advice. Since inception, PODSS has evolved through ongoing analysis of outcomes and consumer feedback from Patient Reported Experience Measures (PREMS) (Bavin, Tobiano & Gillespie, 2023; Tobiano et al., 2025). Vulnerable groups: older adults, those with comorbidities, low health literacy, or culturally and linguistically diverse backgrounds were prioritised due to higher risks of post-operative complications (Tyler et al., 2023; WHO, 2016). High-risk specialties, including general surgery, gynaecology, urology, ENT, and orthopaedics, were also targeted (AIHW, 2023; Brown et al., 2020).

Methods

PODSS primarily functions as a patient or carer-initiated service. All discharged surgical patients receive a direct PODSS phone number for advice, reassurance, or escalation up to 30 days post-operatively. Nurses triage calls using structured clinical assessment, enabling early identification of complications and timely escalation (Mao et al., 2022; Vernon et al., 2019). Escalation pathways include same-day review, GP referral, direct readmission, or ED presentation (WHO, 2016; Clinical Excellence Queensland, 2024).

For vulnerable cohorts, PODSS integrates proactive outreach. CNCs review these patients before discharge, provide tailored education, and initiate targeted follow-up calls after discharge. At STARS, nurses have access to a clinical review space for wound checks, dressing changes, and mobility assessments. Flexibility is central: patients can submit wound photos, receive phone reassurance, or have investigations arranged. Where escalation is required, PODSS nurses fast-track surgical team reviews or arrange direct ward admission, bypassing ED (Eustache et al., 2023; Lumpkin et al., 2020).

Results

Since implementation, STARS PODSS has supported over 5,300 episodes of care. Within its first year, NSQIP data showed a 30% reduction in ED presentations in most specialties, 54% reduction in overall unplanned readmissions, and 25% reduction in surgical site infections (see appendix A). Weighted Activity Unit (WAU) capture offsets staffing costs, while avoided ED visits and readmissions add savings (Austin et al., 2020; Nummedal et al., 2024; Sartini et al., 2022).

Consumer-reported outcomes reinforce the clinical data, with PREMS consistently showing very high satisfaction (90% of consumers rating the service 4-5/5). Patients describe PODSS as reassuring, supportive, and empowering. Feedback has driven refinements such as culturally sensitive communication and tailored escalation pathways (Clinical Excellence Queensland, 2024).

The proven outcomes and financial neutrality of PODSS have directly led to expansion to 13 Queensland hospitals (see appendix B). Local teams adapt processes to context while maintaining the core principles of safety, accessibility, and continuity (Clinical Excellence Queensland, 2024).

Discussion and Conclusion

PODSS has delivered consistent measurable improvements in patient outcomes, system efficiency, and satisfaction, while demonstrating scalability across diverse settings (Clinical Excellence Queensland, 2024; Tyler et al., 2023). Beyond reductions in ED presentations and readmissions, the service has supported new innovations. At Cairns, PODSS underpins orthopaedic pain management protocols; at Ipswich, it enables safe day-case hysterectomies; at the Royal Brisbane and Women's Hospital, it provides proactive outreach for high-risk patients. Some sites have implemented direct referral pathways from Queensland Ambulance Service into PODSS to reduce ramping (Clinical Excellence Queensland, 2024; Nummedal et al., 2024).

Iterative improvement cycles, driven by CNC leadership and executive commitment, have embedded PODSS as part of routine surgical care (Clinical Excellence Queensland, 2024). Benchmarking outcomes against NSQIP and presenting results nationally and internationally, such as at the American College of Surgeons' Safety and Quality Conference and inaugural ACS Grand Rounds webinar highlight its broader relevance (Clinical Excellence Queensland, 2024; Tyler et al., 2023).

In conclusion, PODSS shows how evidence-based design, consumer engagement, and clinical leadership can bridge the "black hole" of post-discharge care. By reducing complications, readmissions, and ED demand while embedding consumer voice and equity, PODSS provides safer, more responsive recovery support. Its integration of consumer focus, leadership, continuous improvement, and proven outcomes positions PODSS as both a model of excellence for STARS and a scalable innovation for health systems more broadly (WHO, 2016; Clinical Excellence Queensland, 2024).

REPORT

APPLICATION OF ACHS PRINCIPLES

1. Consumer Focus

The Post-Operative Discharge Support Service (PODSS) was designed in response to the needs of surgical patients who frequently experienced challenges after discharge, particularly in accessing timely care before their scheduled outpatient review (Bavin, Tobiano & Gillespie, 2023; Kang et al., 2020a). Clinicians recognised that patients often faced limited availability of General Practitioners, barriers to access for those with low socioeconomic status or low health literacy and felt the Emergency Department (ED) was their only option when post-operative concerns arose (Morley et al., 2018; Brown et al., 2020). PODSS was therefore established to

address this gap and place the consumer at the centre of care by providing accessible, coordinated, and timely post-discharge support (WHO, 2016; Clinical Excellence Queensland, 2024).

From the outset, PODSS prioritised understanding consumer needs. National Surgical Quality Improvement Program (NSQIP) data highlighted patterns of complications, readmissions, and Emergency Department presentations (Brown et al., 2021; Tyler et al., 2023). It was noted that patients were often presenting to the ED for things like wound dressing changes, reassurance, or additional pain relief (Brown et al., 2020). These insights confirmed that patients required a service which offered reassurance, clear communication, and rapid escalation when necessary. The model of care directly responds to these findings by giving patients access to experienced Clinical Nurse Consultants who can provide advice, education, and escalation of concerns up to 30 days after surgery (Mao et al., 2022; Vernon et al., 2019).

The service is designed to be patient-led and uniquely offers open access to all surgical patients. Every patient discharged from STARS is provided with the direct contact number for PODSS nurses, who are available to take calls about any concerns during recovery. Unlike traditional community or hospital avoidance programs that rely on narrow inclusion criteria, PODSS is flexible and inclusive, ensuring no patient is excluded from support. This simple access point provides a clear, reliable pathway for post-discharge care, removing the need to navigate complex hospital systems. Many patients describe the service as empowering, reporting that the ability to "just call the PODSS nurse" reduces anxiety, improves confidence, and provides reassurance that support is available whenever it is needed (Bavin, Tobiano & Gillespie, 2023; Tobiano et al., 2025).

While PODSS is open to all surgical patients, it places particular emphasis on those who are most vulnerable. Older adults, patients with limited health literacy, culturally and linguistically diverse populations, and those with multiple comorbidities are proactively supported (WHO, 2016; Tyler et al., 2023). Nurses meet these patients before discharge, ensuring they understand recovery expectations and how to access PODSS. Tailored education and proactive follow-up after discharge reduce the risk that these groups are left unsupported. By embedding equity and cultural safety into its design, PODSS ensures all patients, not only those able to advocate for themselves, receive timely and coordinated care (Clinical Excellence Queensland, 2024).

Consumer feedback is central to the ongoing evaluation and refinement of PODSS. Patient Reported Experience Measures (PREMS) are routinely collected, and results consistently demonstrate very high levels of satisfaction (Bavin, Tobiano & Gillespie, 2023). Patients frequently report that PODSS prevented unnecessary hospital visits, made them feel cared for, and provided reassurance during a vulnerable time in their recovery. This feedback is not only collected but actively acted upon. For example, PREMS results have led to the introduction of culturally sensitive communication strategies, and tailored escalation pathways aligned with patient preferences (Clinical Excellence Queensland, 2024; Tobiano et al., 2025).

Flexibility in service delivery also reflects consumer priorities. Patients are able to call at any time during service hours within the 30-day post-operative period, send wound photographs for review, or request in-person assessments where required (Eustache et al., 2023; Clinical Excellence Queensland, 2024). For some, reassurance and education over the phone are sufficient; for others, direct escalation to the surgical team or expedited outpatient review is necessary. This tailored approach ensures that PODSS responds to individual needs while avoiding unnecessary Emergency Department use (Lumpkin et al., 2020; Nummedal et al., 2024).

The impact of this consumer-centred model is reflected in both outcomes and experience. Patients report reduced anxiety, improved recovery confidence, and greater satisfaction with their surgical care; clinicians observe earlier identification of complications and more appropriate escalation of care; and health service leaders recognise reduced Emergency Department demand and improved continuity of care (Tyler et al., 2023; Sartini et al., 2022).

In summary, PODSS demonstrates consumer focus by identifying and responding to gaps in post-discharge care, embedding equity and access for vulnerable groups, prioritising the consumer voice through PREMS, and delivering flexible, patient-led care (WHO, 2016; Clinical Excellence Queensland, 2024; Tobiano et al., 2025).

2. Effective Leadership

The Post-Operative Discharge Support Service (PODSS) has been shaped and sustained through strong, multi-level leadership that demonstrates responsibility and commitment to safe, high-quality surgical care (Clinical Excellence

Queensland, 2024). Leadership has been evident from the earliest stages of program design through to its successful expansion across Queensland, with clinical, operational, and executive leaders all playing critical roles in its success (Clinical Excellence Queensland, 2024).

Clinical leadership has been the foundation of PODSS. Clinical Nurse Consultants (CNCs) lead day-to-day service delivery, applying their advanced knowledge and skills to triage patient concerns, provide education, and ensure timely escalation. Their leadership extends beyond individual patient care, with CNCs driving service refinements such as improved communication strategies, integration of electronic medical record documentation, and ongoing data-driven quality improvements (Clinical Excellence Queensland, 2024). These frontline leaders act as the voice of the patient, consistently advocating for improvements that enhance safety and patient experience.

Surgeons have provided the vision and advocacy necessary to embed PODSS into core models of surgical care. They have used National Surgical Quality Improvement Program (NSQIP) data to identify priority areas and present the clinical case for PODSS at local, statewide, and national forums (Clinical Excellence Queensland, 2024). Their commitment has been crucial in engaging their surgical colleagues, encouraging collaboration with CNCs, and reinforcing the value of PODSS as an evidence-based intervention (Tyler et al., 2023).

Executive leadership has ensured the program's alignment with organisational priorities and sustainability. Leaders within Metro North Health provided direction and oversight to establish PODSS at STARS, recognising its potential to address identified gaps in post-operative care while contributing to broader goals of reducing Emergency Department demand and improving patient outcomes (Clinical Excellence Queensland, 2024). Ongoing executive commitment has secured resources, supported staffing, and endorsed PODSS as a standard component of surgical care. This leadership has also been instrumental in scaling the program across other hospitals, demonstrating trust in the model and its outcomes (Clinical Excellence Queensland, 2024).

The collaborative nature of PODSS leadership is a defining strength, fostering an environment where staff are empowered to contribute, develop, and innovate (Sekhon, Cartwright & Francis, 2017). Clinical Nurse Consultants are supported by surgical and executive leaders to identify and act on opportunities for improvement, ensuring frontline insights directly shape service design. This collaboration has created a model that is operationally sustainable, clinically relevant, and consistently focused on patient needs (Clinical Excellence Queensland, 2024).

Crucially, leadership has now extended beyond individual hospitals to drive change at a statewide level. Clinical Excellence Queensland (CEQ) has played a pivotal role in facilitating the implementation of PODSS across Queensland, with six hospitals receiving dedicated funding to establish services and a further seven sites self-funding their adoption of the model. A statewide PODSS Collaborative has been established, bringing together representatives from every participating hospital to share trends, learnings, resources, and innovations (Clinical Excellence Queensland, 2024). This forum ensures that improvements made at one site can be rapidly disseminated to others, avoiding duplication of effort and reinforcing the principle that "we don't reinvent the wheel."

Through this collaborative approach, PODSS has moved from a local innovation to a system-wide program of work, underpinned by leadership at every level (Clinical Excellence Queensland, 2024). CEQ provides overarching strategic direction, local executives ensure sustainability within their services, surgical champions advocate for clinical alignment, and CNCs drive frontline delivery and improvement. Together, these layers of leadership have created a statewide PODSS "revolution" that is improving outcomes, strengthening equity, and setting a new benchmark for post-operative care in Queensland (Clinical Excellence Queensland, 2024; Alami et al., 2023).

In summary, effective visionary leadership has been central to the success of PODSS. From frontline nurses to hospital executives and state-level agencies, collaborative leadership has inspired innovation, facilitated expansion, and embedded PODSS as a sustainable model of excellence (Clinical Excellence Queensland, 2024). PODSS is the essence of cross-institutional collaborative healthcare quality improvement.

3. Continuous Improvement

Continuous improvement is embedded at the core of the Post-Operative Discharge Support Service (PODSS). From its inception, the program was designed not as a fixed model, but as a dynamic service that evolves in response to patient outcomes, consumer feedback, clinical insight and local health service needs (Tyler et al., 2023; Tobiano et

al., 2025). This commitment to continuous refinement has ensured that PODSS consistently delivers safe, highly effective, and responsive patient-centred care.

The foundation for improvement is data. PODSS was established in direct response to National Surgical Quality Improvement Program (NSQIP) findings, which highlighted high rates of unplanned readmissions and Emergency Department presentations. Before implementation, STARS was benchmarked at the 99th adjusted percentile for readmissions across all participating hospitals worldwide, and ED presentation rates of approximately 12–15%. Ongoing analysis of NSQIP outcomes continues to guide areas of focus, such as identifying surgical procedures or cohorts with higher risks of complications. For example, laparoscopic cholecystectomy and tonsillectomy patients were identified as frequent re-presenters, prompting proactive pre-discharge engagement and targeted follow-up for these groups. By using data in this way, PODSS translates clinical evidence into practical improvements in care delivery (Clinical Excellence Queensland, 2024).

Consumer feedback provides another powerful driver of continuous improvement. Patient Reported Experience Measures (PREMS) are routinely collected and reviewed, allowing the service to adapt directly to consumer needs and expectations (Bavin, Tobiano & Gillespie, 2023; Tobiano et al., 2025). Feedback has led to changes including the introduction of culturally sensitive communication and tailored escalation pathways. Patients consistently describe PODSS as reassuring and empowering, and their suggestions are treated as opportunities for service development. This systematic use of patient voice ensures that the service evolves in line with consumer expectations while maintaining high levels of satisfaction (Clinical Excellence Queensland, 2024).

Clinical staff also play a central role in improvement. Clinical Nurse Consultants (CNCs) who deliver the service are empowered to identify opportunities for refinement and innovation, with support from leadership. Their contributions have led to refinements such as enhanced call scripts, improved wound assessment workflows, and improved discharge analgesia for gynaecology patients (Clinical Excellence Queensland, 2024). This bottom-up approach ensures that frontline insights are valued and translated into meaningful changes that improve both efficiency and safety.

PODSS has also embraced digital and operational innovation as part of its improvement cycle. The ability for patients to send photographs of wounds for review, or for nurses to organise investigations such as blood tests, swabs, and imaging, has expanded the scope of the service. At STARS, access to a clinical review space allows PODSS nurses to provide face-to-face care when needed, such as wound checks, dressing changes, or mobility reviews (Clinical Excellence Queensland, 2024). These operational enhancements demonstrate a willingness to adapt the service to meet real-world needs and avoid unnecessary Emergency Department presentations (Eustache et al., 2023; Lumpkin et al., 2020).

The statewide expansion of PODSS has created further opportunities for sustained and wide-spread continuous improvement. Thirteen hospitals have now adopted the model, with each site tailoring PODSS to local needs while adhering to its core principles (see appendix B). This has generated innovation across the state: Cairns Base Hospital has introduced new post-operative pain management protocols for orthopaedic patients; Ipswich Hospital has used PODSS to enable safe day-case hysterectomies; the Royal Brisbane and Women's Hospital has introduced proactive outreach calls for high-risk patients; and some hospitals are piloting direct referrals from the Queensland Ambulance Service to reduce ambulance ramping (see appendix C) (Clinical Excellence Queensland, 2024; Nummedal et al., 2024). A statewide PODSS Collaborative, facilitated by Clinical Excellence Queensland, provides a forum for sites to share lessons, trends, and resources. Improvements trialled at one site can be rapidly disseminated to others, avoiding duplication and accelerating system-wide learning (see appendix C) (Clinical Excellence Queensland, 2024).

This culture of continuous improvement ensures that PODSS is not static but evolves to meet emerging challenges and patient needs. It remains closely aligned with Queensland Health priorities, while also contributing to the local health system through improved outcomes, patient satisfaction, and efficiency (Tyler et al., 2023; Tobiano et al., 2025).

In summary, PODSS demonstrates continuous improvement by systematically using data, consumer feedback, and frontline insights to refine its model of care, expanding its scope to include digital innovations, in-person reviews, and targeted outreach for high-risk cohorts, while fostering statewide collaboration to share improvements across multiple hospitals (Clinical Excellence Queensland, 2024; Eustache et al., 2023; Nummedal et al., 2024).

4. Evidence of Outcomes

The success of the Post-Operative Discharge Support Service (PODSS) is underpinned by robust evidence of outcomes across clinical safety, patient experience, and system efficiency. From its inception, the service has prioritised measurement and evaluation to demonstrate its effectiveness and guide ongoing refinement (Tyler et al., 2023; Tobiano et al., 2025).

The most compelling evidence comes from National Surgical Quality Improvement Program (NSQIP) outcomes. Within its first year of operation at STARS, PODSS was associated with a 30 percent reduction in Emergency Department presentations for most specialties, a 54 percent reduction in overall unplanned readmissions, and a 25 percent reduction in surgical site infections (see appendix A). These results confirm that the model not only addresses identified risks but also delivers sustained improvements in overall hospital flow, patient safety and clinical quality (Brown et al., 2021; Veličković et al., 2020; Tyler et al., 2023). Outcomes continue to be tracked through NSQIP data, which provides reliable, risk-adjusted benchmarking against national and international comparators (Tyler et al., 2023). Reductions in ED presentations have been consistently observed across multiple hospitals, confirming the effectiveness of PODSS in preventing unnecessary attendances. Across five sites and six surgical specialties, outcomes include a 29.9% reduction in General Surgery, 23.7% in Orthopaedics, 30.5% in Urology, 37.5% in Plastics, and 22.5% in Gynaecology (see appendix B).

Financial and operational outcomes further support the case for the sustainable PODSS model. The service is cost-neutral, with Weighted Activity Unit (WAU) capture offsetting staffing costs. In addition, avoided Emergency Department presentations, unplanned readmissions, and reduced same day surgery cancellations generate significant savings for the health system (Sartini et al., 2022; Austin et al., 2020; Nummedal et al., 2024).

Consumer-reported outcomes provide another important layer of evidence. Patient Reported Experience Measures (PREMS) are collected routinely, and results consistently reflect high levels of satisfaction. Patients frequently describe PODSS as reassuring, supportive, and empowering, with many reporting that the service prevented unnecessary hospital visits (Bavin, Tobiano & Gillespie, 2023; Tobiano et al., 2025). PREMS also offer actionable insights that have been used to refine the service (Clinical Excellence Queensland, 2024). 96% of consumers who complete the PREMS questions at STARS reported that they felt their concerns were address in a timely manner, and 90% of consumers knew about PODSS prior to discharge. Statewide, the overall satisfaction rate of PODSS patients sits at 93% (see appendix B).

Operational outcomes demonstrate the scope of what PODSS can achieve beyond phone advice. Nurses are able to organise investigations such as blood tests, swabs, and imaging, and fast-track surgical team reviews. Access to a dedicated clinical review space at STARS allows face-to-face wound checks, dressing changes, and mobility assessments, further preventing unnecessary Emergency Department presentations (Clinical Excellence Queensland, 2024; Eustache et al., 2023; Lumpkin et al., 2020). These operational metrics highlight the flexibility and responsiveness of the model and provide tangible evidence of its ability to address complications early.

Recognition at national and international forums further validates the outcomes achieved. PODSS results have been presented at the American College of Surgeons' Safety and Quality Conference and featured as the inaugural ACS Grand Rounds webinar, with strong engagement from international surgical and quality experts (Clinical Excellence Queensland, 2024; Tyler et al., 2023).

In summary, PODSS demonstrates clear evidence of outcomes across multiple domains, clinical, financial, consumer-reported, operational, and scalability; showing a proven, effective, and sustainable model of care that delivers measurable improvements for patients, clinicians, and the health system (Brown et al., 2021; Clinical Excellence Queensland, 2024; Tyler et al., 2023).

5. Striving for Best Practice

The Post-Operative Discharge Support Service (PODSS) was designed not only to address local challenges in post-operative care but also to align with national and international standards of best practice. From its inception, PODSS has been informed by National Surgical Quality Improvement Program (NSQIP) data, which provides risk-adjusted benchmarking across hundreds of hospitals worldwide (Tyler et al., 2023). Outcomes continue to be tracked against NSQIP benchmarks, ensuring that performance is measured against both national and

international comparators and that improvements are evidence-based and reliable (Tyler et al., 2023; Clinical Excellence Queensland, 2024).

Benchmarking has enabled PODSS to identify areas of opportunity and apply proven best-practice approaches. For example, NSQIP data highlighted high rates of unplanned readmissions and surgical site infections, prompting targeted interventions including early patient contact, wound surveillance, and streamlined escalation pathways (Tyler et al., 2023; Clinical Excellence Queensland, 2024). These measures reflect global best-practice strategies in post-operative care but are adapted locally to suit patient needs and service contexts (WHO, 2016; AIHW, 2023). This adaptability ensures PODSS is not only informed by best practice but also contributes to it by developing new approaches that can be shared with others (Clinical Excellence Queensland, 2024).

Learning from other services has been another cornerstone of PODSS's success. Clinical Excellence Queensland (CEQ) has facilitated collaboration across 13 hospitals that have now adopted or adapted the model, creating a statewide PODSS Collaborative that enables rapid dissemination of best practice across the state (Clinical Excellence Queensland, 2024).

In addition to statewide collaboration, PODSS has contributed to international best practice through recognition and dissemination of its outcomes. Presentations at the American College of Surgeons' Safety and Quality Conference, and selection as the inaugural ACS Grand Rounds webinar topic, have positioned PODSS as a model of innovation with global relevance (Clinical Excellence Queensland, 2024; Tyler et al., 2023). Locally, the program has also been acknowledged through Health Service awards for Clinical Excellence at the Royal Brisbane and Women's Hospital (RBWH) and Mackay, as well as two Nurse of the Year awards recognising PODSS leaders at STARS and the Princess Alexandra Hospital (PAH). Together, these achievements demonstrate that PODSS is not only delivering measurable improvements in outcomes but is also being celebrated as a benchmark for clinical excellence and nursing leadership at local, national, and international levels.

The model also incorporates emerging best-practice principles in health service design, including patient-centred care, equity, and digital innovation. By providing direct access to experienced Clinical Nurse Consultants, embedding culturally sensitive communication, and enabling flexible care via phone and in-person review, PODSS aligns with global movements towards integrated, consumer-focused care (WHO, 2016; Tobiano et al., 2025). Innovations such as patient-submitted wound photographs, nurse-initiated investigations, and streamlined direct readmissions bypassing Emergency Departments further demonstrate PODSS's ability to apply and extend best-practice approaches (Eustache et al., 2023; Mao et al., 2022).

Importantly, PODSS strives for best practice not only by benchmarking and learning from others but by serving as a platform for innovation. Its statewide scale-up has created a consistent framework that delivers reliable outcomes, while allowing sites to adapt the model to local needs and trial new practices that can inform future care (Clinical Excellence Queensland, 2024; Nummedal et al., 2024).

In summary, PODSS demonstrates its commitment to best practice through rigorous benchmarking with NSQIP, active learning and knowledge-sharing across Queensland, dissemination of its outcomes internationally, and the integration of patient-centred and equity-focused innovations into care—the program not only adopts best practice but also generates it (Tyler et al., 2023; Clinical Excellence Queensland, 2024; WHO, 2016; Tobiano et al., 2025).

INNOVATION IN PRACTICE AND PROCESS

The Post-Operative Discharge Support Service (PODSS) represents a significant innovation in post-operative care, transforming the way surgical patients are supported after discharge. Traditionally, patients discharged from hospital have limited access to specialist advice until their follow-up appointment, often four to six weeks later. In this period, concerns commonly escalate to Emergency Department presentations, contributing to system pressure and avoidable readmissions. PODSS disrupts this model by providing patients with direct access to experienced Clinical Nurse Consultants for up to 30 days after surgery, supported by clear escalation pathways to ensure safe, timely, and coordinated care.

This innovation shifts the focus of post-operative care from reactive, hospital-based management to proactive, patient-centred support in the community. The ability for patients to directly contact PODSS nurses, send wound

photographs for review, and receive immediate education and reassurance is a departure from traditional pathways. Nurses can also organise investigations such as blood tests, swabs, and imaging, arrange expedited outpatient review, or facilitate direct readmission to the ward, bypassing the Emergency Department entirely. At STARS, access to a dedicated clinical review space has further expanded the scope of the service, enabling wound checks, dressing changes, and mobility assessments in a safe, nurse-led environment.

PODSS is also innovative in the way it targets vulnerable cohorts. By proactively engaging older patients, those with comorbidities, Aboriginal and Torres Strait Islander patients, and those with limited social supports, the service ensures equity of access and reduces the likelihood that at-risk groups are left to navigate the health system alone. This focus on equity, combined with culturally sensitive communication and tailored education, reflects best practice in inclusive care design.

In summary, PODSS demonstrates innovation in both practice and process. It replaces reactive, hospital-centred follow-up with proactive, patient-led support; empowers nurses to manage and escalate concerns flexibly; embeds equity through targeted outreach; and provides a platform for further service innovations. This combination has redefined post-operative care, delivering measurable improvements in outcomes and setting a new benchmark for surgical safety and quality.

APPLICABILITY TO OTHER SETTINGS

The Post-Operative Discharge Support Service (PODSS) has demonstrated strong applicability beyond its original site, with proven scalability and adaptability across diverse hospital contexts. What began as a local innovation at the Surgical Treatment and Rehabilitation Service (STARS) has now grown into a statewide program, with 13 hospitals across Queensland adopting or adapting the model. PODSS has now supported over 27,000 Queenslanders to recover safely after surgery. This spread confirms PODSS is not only effective but also transferable, offering a framework that can be applied across a range of surgical services and health system environments.

The expansion of PODSS has been facilitated by Clinical Excellence Queensland (CEQ), which has supported six hospitals with dedicated funding while a further seven have self-funded implementation A statewide PODSS Collaborative has been established, providing a forum for sites to share resources, trends, and innovations. This collaborative approach has ensured that each hospital benefits from the experience of others, accelerating adoption and avoiding duplication of effort. Sustained, improved, and reproducible outcomes have been demonstrated across Queensland, with consistent reductions in Emergency Department presentation rates of 30–40% statewide, alongside strong patient-reported experience results averaging 4.3 out of 5 across all sites.

The statewide scale-up of PODSS illustrates its value as a replicable and sustainable model that can be applied in both metropolitan and regional contexts. Its strength lies in the simplicity of its core principles, patient access to experienced nurses, proactive support for vulnerable groups, clear escalation pathways, and continuous improvement informed by data and consumer feedback. These principles are universal and can be embedded in any surgical service seeking to improve outcomes, reduce system demand, and enhance patient experience.

In summary, the spread of PODSS across Queensland demonstrates its applicability to other settings. It is a patient-centric, flexible, and economical evidence-based model that has proven scalable across hospitals of different sizes and contexts. Statewide implementation has been associated with sustained improvements in post-operative outcomes, including consistent reductions in Emergency Department presentations and readmissions. PODSS now provides a framework that can be replicated nationally and internationally to deliver safer, more responsive post-operative care.

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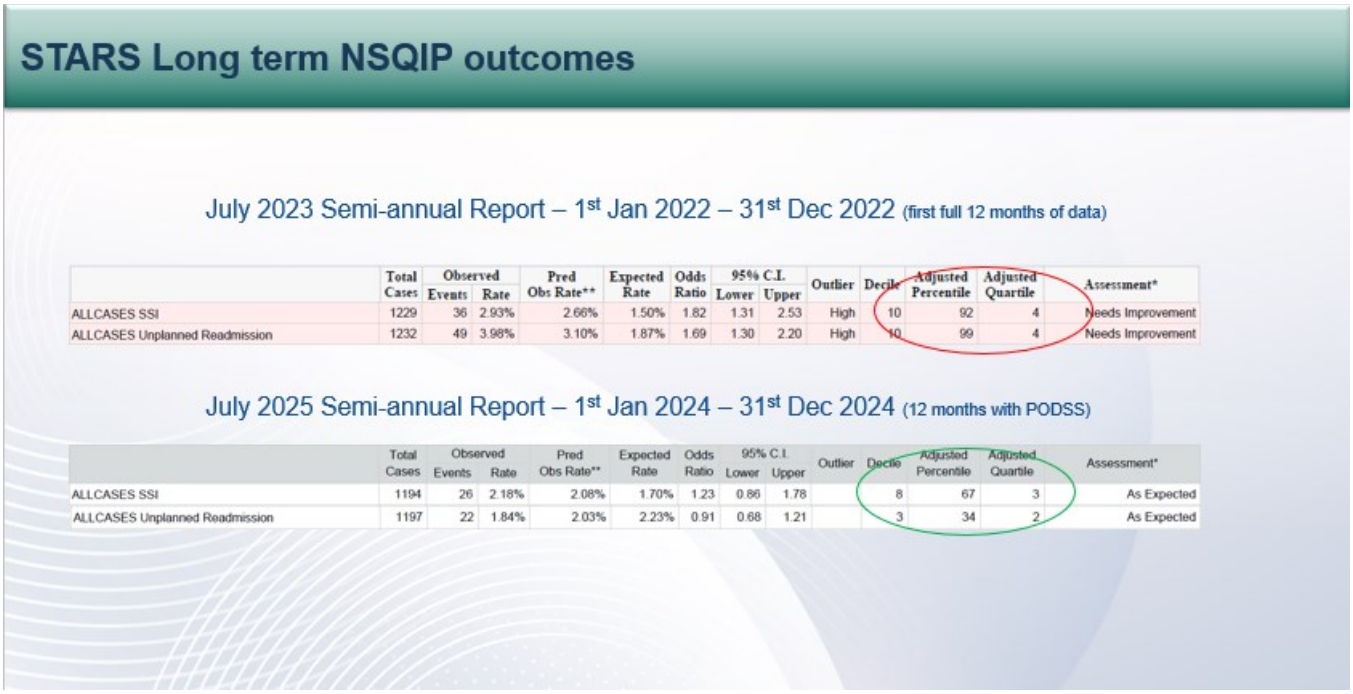
APPENDIX

Appendix A – NSQIP risk-adjusted and benchmarked reports showing reduction in readmissions and surgical site infections



STARS Long term NSQIP outcomes

July 2023 Semi-annual Report – 1st Jan 2022 – 31st Dec 2022 (first full 12 months of data)

	Total Cases	Observed Events	Observed Rate	Pred Obs Rate**	Expected Rate	Odds Ratio	95% C.I. Lower	95% C.I. Upper	Outlier	Decile	Adjusted Percentile	Adjusted Quartile	Assessment*
ALLCASES SSI	1229	36	2.93%	2.66%	1.50%	1.82	1.31	2.53	High	10	92	4	Needs Improvement
ALLCASES Unplanned Readmission	1232	49	3.98%	3.10%	1.87%	1.69	1.30	2.20	High	10	99	4	Needs Improvement

July 2025 Semi-annual Report – 1st Jan 2024 – 31st Dec 2024 (12 months with PODSS)

	Total Cases	Observed Events	Observed Rate	Pred Obs Rate**	Expected Rate	Odds Ratio	95% C.I. Lower	95% C.I. Upper	Outlier	Decile	Adjusted Percentile	Adjusted Quartile	Assessment*
ALLCASES SSI	1194	26	2.18%	2.08%	1.70%	1.23	0.86	1.78		8	67	3	As Expected
ALLCASES Unplanned Readmission	1197	22	1.84%	2.03%	2.23%	0.91	0.68	1.21		3	34	2	As Expected

Queensland Health

PODSS revolution - it's just better care!

Reducing unnecessary emergency department presentations after surgery.

"Quick response and extremely helpful. Great peace of mind knowing I could connect with someone who had the knowledge of post-op care".
Queensland Children's Hospital PODSS Patient

What is PODSS?

The **Post-Operative Discharge Support Service (PODSS)** was created to reduce the high number of emergency department (ED) presentations by post-operative patients. Data from Queensland's National Surgical Quality Improvement Program (NSQIP) showed that these patients accounted for **more than 10% of ED visits across Queensland.**

PODSS is a nurse-led, rapid-access model of care designed to improve post-operative outcomes for undifferentiated and multi-specialty surgical patients. Through **in-reach, outreach, virtual, and face-to-face follow-up,** the service supports patients with low-acuity surgical concerns for up to **30 days post-discharge.**

PODSS is NOT:

- ✗ a replacement for GP care—we partner with GPs, not replace them
- ✗ an alternative to routine post-operative follow-ups
- ✗ for managing unrelated medical conditions (e.g., asthma exacerbations)
- ✗ a service to prevent necessary ED presentations.

Benefits of PODSS

PODSS benefits all stakeholders – consumers, referrers, patient flow managers, and ED and surgical staff and leadership.

- Direct access to specialised surgical nursing and medical care.
- Streamlined care pathways for better patient outcomes.
- Direct referrals from ED alleviates overcrowding, with some sites (Mackay, Ipswich and Rockhampton) now taking direct referrals from the Queensland Ambulance Service which will help reduce ambulance ramping.
- 93% patient satisfaction rating

Early outcomes

Reduction in average ED presentations across 5 sites and 6 specialties:

- General surgery: 29.9%
- Plastic surgery: 37.5%
- Orthopaedic surgery: 23.73%
- Gynaecology surgery: 22.5%
- Urology surgery: 30.45%
- ENT surgery: 4.65%

Innovation: PODSS goes beyond ED reduction

The availability of a PODSS has made other innovations possible:

- **New post-operative pain management protocols** underway for orthopaedic patients at Cairns Base Hospital.
- Outreach support is enabling the introduction of safe **day case hysterectomies at** Ipswich Hospital.
- The introduction of proactive outreach calls at the Royal Brisbane and Women's Hospital (RBHWH) for laparoscopic cholecystectomy patients led to no **ED presentations** for 2 consecutive months.

What's the key to our success?

- **Extensive stakeholder engagement** – surgeons, ED teams, specialty clinical nurse consultants (CNCs), pre-surgery teams, ward nurses, discharge planners, allied health, GP teams, hospital in the home and other community teams, administration teams, and data teams are all involved in the design and delivery of the service.
- **Dedicated, innovative PODSS CNCs** drive service excellence.
- **Model is lean, efficient, and financially Sustainable** – 1.5FTE (averaged) senior nurses regularly manage 14+ patients daily to support overall hospital flow and reduce unnecessary ED presentations. More than 85% pf PODSS encounters are managed over the phone.
- **Proactive and data-driven** – targeting high-risk surgeries for early intervention.
- **Flexible referral PODSS CNCs pathways** – accepting referrals from multiple sources.
- **Statewide collaboration** – The PODSS Collaborative fosters the sharing of knowledge, resources, and best practices. We don't reinvent the wheel!
- **Strong medical buy-in** – supported by engaged medical leads.

"The nurse was wonderful. Very patient and listened to our concerns. I would definitely recommend this service".
Redcliffe PODSS Patient

"I would have presented back to a GP or hospital had I not spoken to the nurse. She reassured me, explained my procedure, and supported me in making informed decisions. Excellent service."
Mackay PODSS Patient

Ready to launch PODSS at your site?

Search **'PODSS Toolkit'** on QHEPS

OR **scan the QR code** to find the PODSS Project on the Improvement Exchange.

Acknowledgements
Initially developed at the Surgical, Treatment and Rehabilitation Service (STARS) in Metro North Hospital and Health Service, the PODSS model of care was identified as a patient flow initiative suitable for expansion. From March to October 2024, the Healthcare Improvement Unit (HIU), Clinical Excellence Queensland, coordinated the successful implementation of six PODSS sites at Mackay, Rockhampton, Cairns, RBWH, Princess Alexandra, and Ipswich hospitals. The HIU continues to support the PODSS with collaborative service and quality improvement, quality assurance, data driven service expansions, developing innovative referral pathways, and risk and issues management.

Queensland Government

CLINICAL EXCELLENCE AND PATIENT SAFETY

HIGHLY COMMENDED

Perth Children's Hospital, WA

Respiratory Medicine

Year of the Frog: A campaign to address the challenges of regular sputum surveillance for children with cystic fibrosis

Crystal Bourke, Julie Depiazzi, Noula Gibson, Laura Cinanni, Jizelle Kenworthy-Groen, Eloise Connell, Alison Stone, Charlotte Burr, Andre Schultz, and David Hancock

AIM

Sputum sampling plays a critical role in monitoring pathogen growth and informing treatment decisions for children with cystic fibrosis (CF), though it often presents significant practical challenges. This project evaluated whether behaviour change interventions, guided by the COM-B model, could increase the number and frequency of home sputum samples. The approach was family-centred and designed to promote positive engagement, while remaining feasible within existing clinic and hospital resources. The goal was to establish a sustainable model that enables children to consistently meet Australian guidelines of four sputum samples per year.

SUMMARY ABSTRACT

Background

Sputum surveillance is a critical component of respiratory care in children and adolescents with cystic fibrosis (CF), enabling early detection and management of airway pathogens(Evans et al., 2025). Best practice surveillance recommendations is that children with CF should provide at least four sputum samples per year for pathogen testing(Douglas TA, 2023). However, a 2022–2023 audit at Perth Children's Hospital (PCH) found that only 10% of children over six years of age met this target. Notably 82% of collected samples grew pathogens, highlighting the urgent need for more consistent surveillance.

Routine sputum collection can be challenging, particularly for children without a wet cough, a difficulty recognized internationally and highlighted at recent conferences (European CF Conference, 2023, 2025; North American CF Conference 2025). Various strategies have been explored by CF centers to address this issue, including hospital-based induced sputum procedures with suction, and health care professional home visits. These can have negative impacts on costs, resources, clinician and patient time and patient distress. As an alternative strategy, Perth Children's Hospital (PCH) CF service, led by the Physiotherapy Department, launched the "Year of the Frog" campaign. This was a multidisciplinary, behaviour-change initiative aimed at increasing sputum sample frequency and the proportion of children providing at least one sputum sample by 20%, without increasing hospital resource use.

Methods

This 18-month quality improvement initiative was guided by the COM-B Behaviour Change Framework (Capability, Opportunity, Motivation) and implemented across a tertiary paediatric CF clinic(Michie et al., 2011). The campaign focused on enhancing child and family capability through education and training, creating opportunity via environmental (hospital clinic and pathology) restructuring, and boosting motivation through incentivization and modelling. Children aged 6 years and older were provided with sputum collection packs, pathology forms, and instructions for home sampling. Educational resources included audio-visual tools, printed handouts, and frog-themed clinic decorations (Appendices 1-4). The multidisciplinary team (MDT) including physiotherapists, nurses, doctors, lung function scientists, dieticians, and social workers, all actively promoted the campaign during clinic visits, using playful language ("Have you caught a frog lately?"), dressing up in frog themes costumes, and

celebrating sputum sample submissions. Motivational tools such as sputum passports, certificates, and donated prizes were used to reinforce behaviour change. No suctioning or induced sputum procedures were used; all samples were expectorated independently. Sampling data were compared to a baseline cohort from the preceding 18 months, with additional analysis of age, gender, and pathogen detection.

Results
A total of 155 children (84 male, 54%) participated in the intervention, compared to 163 children (78 male, 48%) in the baseline period. The campaign led to a 73% increase in total sputum samples from 282 at baseline to 463 post-intervention. The proportion of children providing at least one sample rose from 57% (93/163) to 80% (124/155), and those reaching the recommended four samples per year increased by 83% (from 31/163 to 54/155). Children aged 9–12 years showed the greatest improvement, with sample provision rising from 56% to 88% of children. The number of children providing zero samples dropped from approximately half to one fifth of the cohort.

Pathogen detection remained consistent throughout both periods. Among children who provided samples, 87% (81/93) had pathogens grown at baseline compared to 88% (109/124) post-intervention. Across all samples, pathogens were identified in 71% (200/282) at baseline and 65% (303/463) during the intervention, suggesting that increased sampling did not compromise microbiological yield.

Quotes from families highlight the tangible impact of the behaviour change intervention: "We caught one! It's not massive but hopefully it's something. Ice cream to celebrate!" - CF parent of 6 y/o boy

"We are all happy dancing around the bathroom as she just caught her first frog up (or frogicon as we've been calling them) in a specimen pot, finally!" - CF parent of 8 y/o girl

"Can you stamp my passport because I caught my third frog last week!" - 11y/o boy with CF who brought his sputum passport to clinic.

Discussion
The "Year of the Frog" campaign demonstrated that sputum sample frequency can be significantly improved through a playful, family-friendly, and evidence-based approach embedded within existing hospital service design. By leveraging the COM-B framework and engaging the full MDT, the initiative created a culture of empowerment and celebration around sputum collection as evidenced by the quotes from families such as "We caught one!" and "Happy dancing around the bathroom!". This highlights the campaign's resonance and its success in transforming a clinical task into a joyful, achievable routine.

While the intervention was broadly successful, adolescents remained more likely to provide zero samples, indicating a need for tailored strategies targeting this age group. The team continues to refine educational tools, incentives, and marketing interventions to focus on adolescent behaviour change strategies to address this gap.

Conclusions
This multidisciplinary, behaviour-change campaign significantly increased sputum sampling rates in children with CF, particularly among those aged 6–12 years. The initiative offers a scalable model for improving respiratory surveillance through education, environmental restructuring, and motivational engagement without requiring additional hospital resources. The ongoing evolution of the campaign reflects the team's commitment to equity, child and family empowerment, and continuous improvement in CF care.

REPORT

APPLICATION OF ACHS PRINCIPLES

1. Consumer Focus

This campaign had a consumer focus at multiple levels. It included co-design through engagement of the peak consumer body for families with cystic fibrosis (CFWA) and embraced family and child centred principles. From the outset, the campaign was designed to be playful, empowering, and engaging. The frog theme was a deliberate strategy to make sputum collection feel less clinical. Families coined their own terms ("frogicon"), shared successes ("happy dancing around the bathroom"), and embraced the challenge with pride. Younger children and their

families are aware of the campaign and report watching the videos and practicing for when their time comes (age 6). These stories were central to the campaign's success and evolution.

Consumer feedback and input from the local CF consumer reference group directly shaped the campaign's tools and tone. When families responded positively to frog passports and themed prizes, the team expanded on those elements. When data showed adolescents were less engaged, the team pivoted to developing tailored resources and incentives to better meet their needs. Two of the resources developed for this initiative were child-focused and adolescent-focused videos with real children with CF describing how they 'catch their frogs'. Having children with CF talking about their experiences of sputum sampling helped normalise this activity and provided information in an easy-to understand and accessible format. Business cards, leaflets and posters in the clinic space with QR links to these videos assisted families to revisit this information when it suited them in the comfort of their own home. Links to the sputum campaign education and information were placed in prominent positions on hospital internet sites such as patient medication re-ordering. Rather than relying on hospital-based sampling, the campaign gave families the tools and confidence to collect sputum at home. Take home 'sputum packs' were designed with consumers to build capability and reduce barriers, empowering families to take an active role in their child's respiratory health.

The initiative tracked data and celebrated it. Children were praised for "catching frogs," families received certificates, and the MDT reinforced positive behaviours at every touchpoint. This created a culture of encouragement and recognition, where families and children's achievements were valued, and motivated.

In addition, the campaign involved several key stakeholders:

- Children and adolescents as active agents of change
- Families as co-designers and feedback providers
- Clinicians as educators and motivators
- CFWA as community champions and resource providers

This collective approach ensured that the campaign was not only clinically effective but socially and emotionally resonant.

2. Effective Leadership

The 'Year of the Frog' was a creative and innovative quality improvement initiative developed and led by senior respiratory physiotherapists, Julie Depiazzi and Crystal Bourke, following their attendance at the 2023 European Cystic Fibrosis Conference. The conference highlighted the critical importance—and persistent challenges—of obtaining regular sputum samples from people with CF. While some international centres were trialling induced sputum procedures, these were highly resource-intensive, requiring 1–1.5 hours of staff time per child, specialised equipment, medications, and in some cases suctioning, which could be distressing for children (Doumit et al., 2016). Demonstrating strategic leadership, Julie and Crystal identified the need for a sustainable, family-friendly solution that could be implemented within the existing resources of the Perth Children's Hospital CF service.

Drawing on their combined 30+ years of experience, credibility, and strong professional networks, Julie and Crystal successfully mobilised the multidisciplinary team —including early-career physiotherapists, nurses, doctors, lung function scientists, dietitians, and social workers—to support and actively participate in the project. Their ability to articulate a clear vision, foster collaboration, and maintain engagement across disciplines was central to the project's success. They also proactively engaged with pathology staff to negotiate and agree on pragmatic, minimal processing requirements for sputum samples, ensuring the initiative was both feasible and sustainable within hospital workflows.

A hallmark of Julie and Crystal's leadership was their commitment to consumer collaboration. They forged a strong partnership with the Western Australian Cystic Fibrosis Association (CFWA), a consumer-led organisation, ensuring the campaign was relevant, accessible, and widely disseminated. Under their guidance, CFWA co-designed resources that reflected consumer perspectives and housed them on their website, amplifying the campaign's reach and strengthening trust with the community.

In addition to driving strategic and consumer engagement, Julie and Crystal provided mentorship and capacity-building within the physiotherapy department. They trained and supported three junior physiotherapists,

equipping them with skills in quality improvement methodology and leadership, while also deepening their clinical expertise. This commitment to developing the next generation of clinicians highlights their broader leadership contribution beyond the immediate project.

Both Julie and Crystal are respected leaders within the physiotherapy department and the wider CF service, actively engaged in multiple quality improvement and research initiatives. Their ability to translate vision into practice, foster multidisciplinary and consumer partnerships, and build team capacity underscores the depth and breadth of their leadership.

In summary, the 'Year of the Frog' project showcases Julie and Crystal's effective leadership—through innovation, collaboration, and mentorship—which ensured the successful design, implementation, and sustainability of this family-centred initiative, now embedded into ongoing clinical practice.

3. Continuous Improvement

The "Year of the Frog" sputum campaign at Perth Children's Hospital was a data-driven approach to continuous improvement in healthcare. This initiative addressed a significant care issue: the difficulty of meeting evidence-based guidelines related to obtaining regular sputum samples from children and adolescents with CF, particularly those without a wet cough. Without consistent sputum surveillance, clinicians cannot reliably assess airway infection status making it difficult to determine whether care is truly effective or timely.

This project used data to assess service effectiveness, comparing sputum sampling rates before and after the intervention. The before and after metrics of sputum sampling frequency provided clear evidence of improved clinical surveillance and more equitable access to pathogen detection. It also utilised behaviour change interventions, and these were measured using qualitative family feedback.

The QI activity spanned 36 months (baseline and rollout). It involved an iterative process with changes made in response to consumer and clinician input. Families were actively involved in improvement activities, not just as recipients of care but as co-creators through their feedback which shaped the campaign's tone, tools, and incentives. Prizes (sponsored by CFWA) encouraged key points in the sputum collection journey - large prizes for first and fourth sputum, and small motivational prizes at clinic. These kept the campaign alive and at the forefront for patients, families and clinicians so that the project continues to gain traction over time.

The campaign also demonstrated a continuous iterative process assessing change, acting on feedback, and modifying strategies as exemplified by the current iteration for adolescents. When data revealed that adolescents were less likely to provide samples, the team has responded by refining educational tools and tailoring incentives to better engage this age group. CFWA has also confirmed their ongoing support for the project for another year until end of 2026, reflecting the community's engagement and support for this initiative.

4. Evidence of Outcomes

The 'Year of the Frog' campaign demonstrated substantial improvements in sputum surveillance, far exceeding the initial target of a 20% increase in both sample frequency and the proportion of children providing at least one sample. The baseline period spanned January 2022 to June 2023, during which 163 families had children aged six years or older attending the clinic. The intervention period ran from July 2023 to December 2024, during which 155 children were seen. The difference in numbers reflects the natural flow of children transitioning into the paediatric service and others moving to adult care.

Across these clinic cohorts, there was a 73% increase in total sputum samples collected (282 at baseline vs 463 post intervention), a 40% rise in the number of children providing at least one sample (93/163 [57%] vs 124/155 [80%]), and an 83% increase in the proportion achieving the recommended four annual samples (31/163 [19%] vs 54/155 [35%]). The most marked improvement was observed in children aged 9-12 years, with the proportion providing at least one sample rising from 56% (23/41) to 88% (46/52).

To provide a clearer picture of change within individual children, we also analysed paired data, including only the 150 children with data available at both baseline and post-intervention. In this cohort, the average number of samples per child increased significantly, from 1.84 (SD 2.24) to 2.88 (SD 2.74) post intervention ($p<0.0001$).

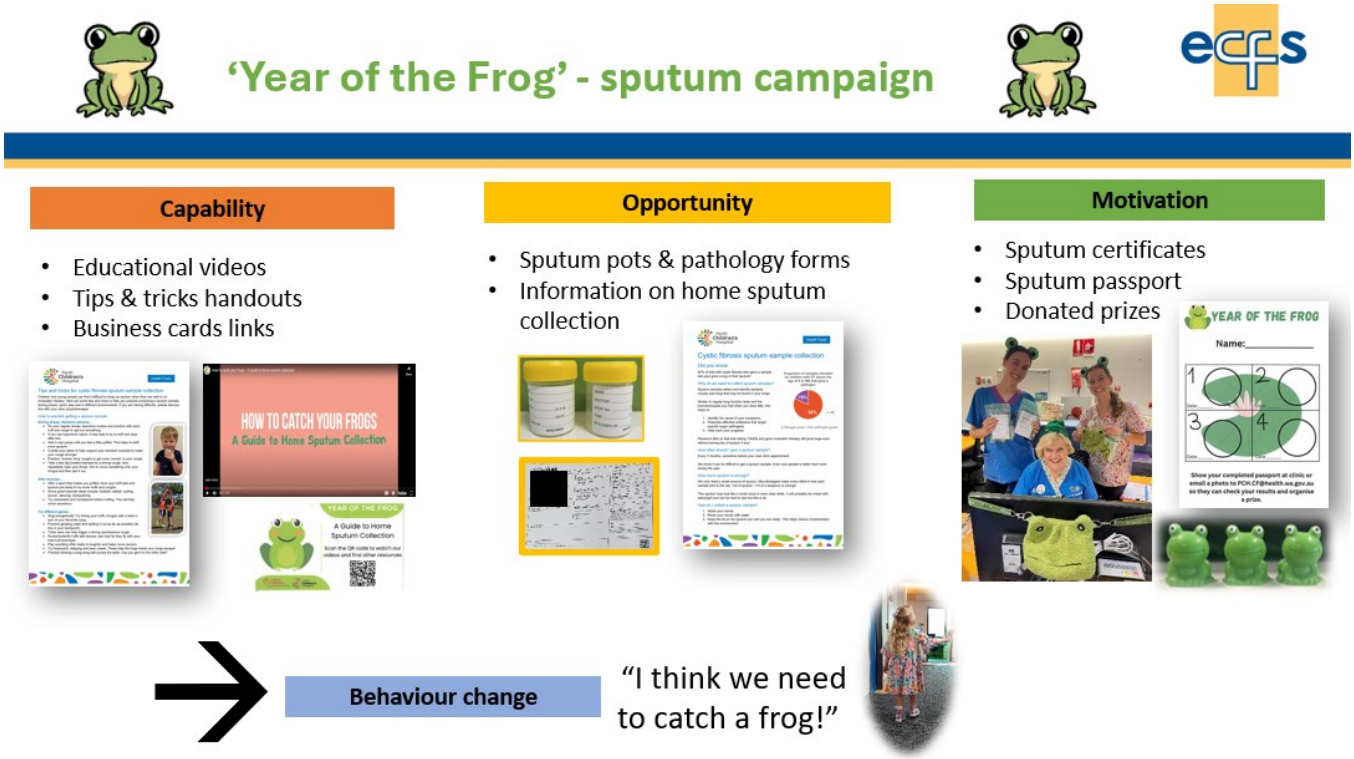
These increases translated into meaningful clinical outcomes. Pathogen detection remained consistently high (81/93 [87%] at baseline vs 109/124 [88%] post intervention), reinforcing the importance of regular sputum surveillance. Within the paired cohort (n=150), there was a 67% increase in the identification of Staphylococcus Aureus (55 children at baseline vs 92 post intervention). Staphylococcus Aureus is a pathogenic bacteria associated with increased lung damage (known as bronchiectasis) and reduced lung function in children with CF(Caudri et al., 2018). As a direct result, 37 children received treatments they may not otherwise have received, supporting more proactive management of long-term lung health.

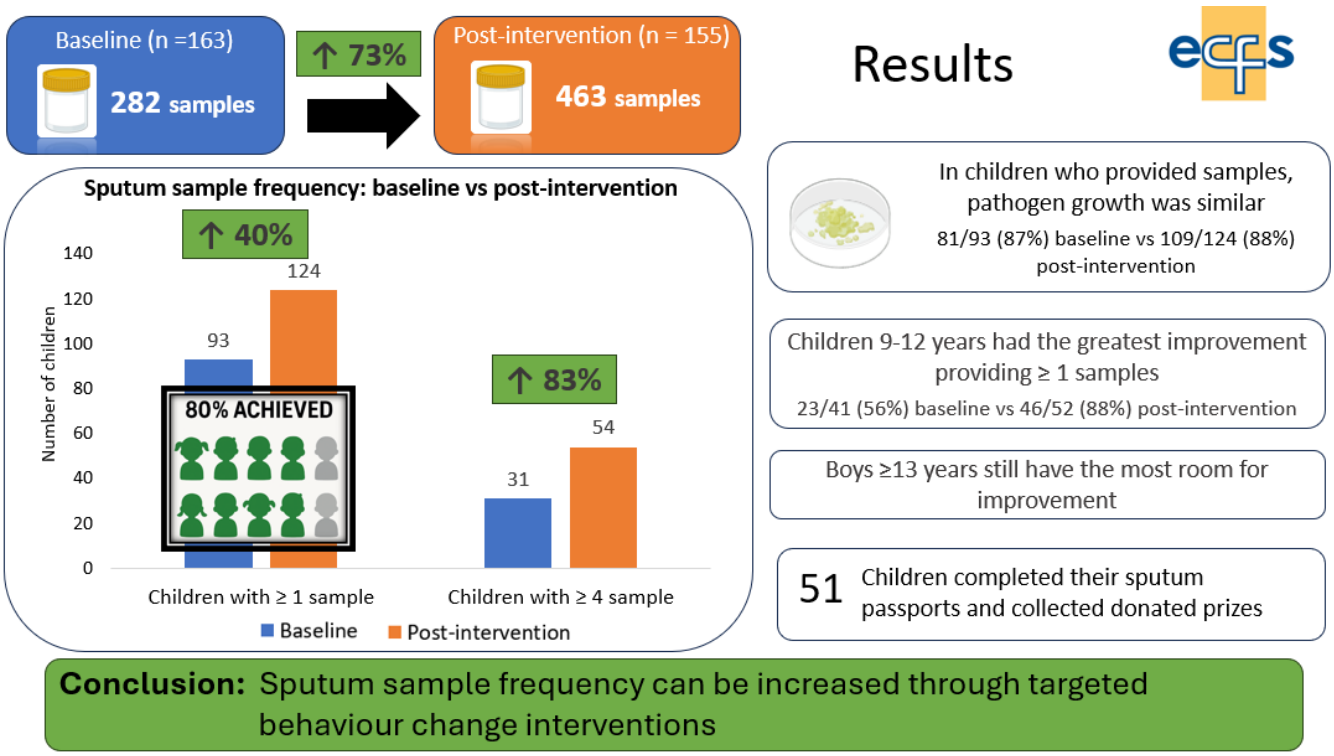
Beyond the numerical outcomes, the project empowered children and families to take an active role in care. Feedback from participants shaped the tone and tools of the campaign, from frog-themed decorations to playful language such as, "Have you caught a frog lately?". Families were kept informed with updates about baseline results and ongoing progress throughout the project.

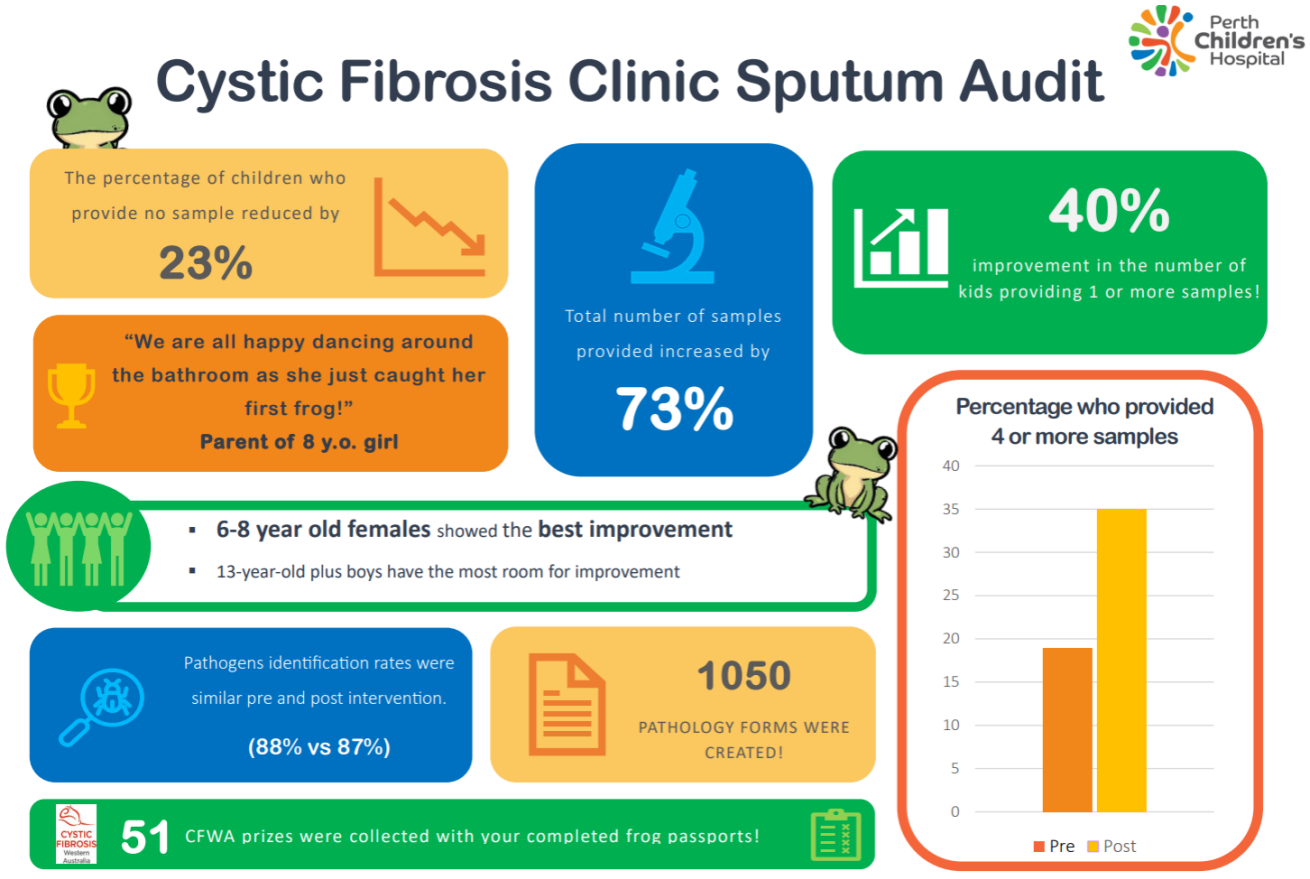
The results have been disseminated widely: internationally at the European CF Conference, nationally at respiratory and CF conferences, and locally to clinicians and the participating CF families. The project has been enthusiastically embraced by the children, families, and broader CF community, generating ongoing momentum in the clinic. Julie and Crystal continue to see children attending CF clinic excited to report they have 'caught another frog'.

Looking forward, the 2025 audit will provide insights into whether these improvements are sustained as the campaign becomes further embedded in clinic routines. The team plans to continue monitoring sputum sampling behaviours to assess the long-term sustainability of this family-centred, low-cost, behaviour change intervention.

Slides presented at European CF Conference June 2025 summarising key methodology and results from the project:




Baseline (n =163)
282 samples
↑ 73%
Post-intervention (n = 155)
463 samples
Results
Sputum sample frequency: baseline vs post-intervention
↑ 40%
↑ 83%
80% ACHIEVED
Number of children
140
120
100
80
60
40
20
0
93
124
31
54
Children with ≥ 1 sample
Children with ≥ 4 sample
Baseline
Post-intervention
In children who provided samples, pathogen growth was similar
81/93 (87%) baseline vs 109/124 (88%) post-intervention
Children 9-12 years had the greatest improvement providing ≥ 1 samples
23/41 (56%) baseline vs 46/52 (88%) post-intervention
Boys ≥13 years still have the most room for improvement
51 Children completed their sputum passports and collected donated prizes
Conclusion: Sputum sample frequency can be increased through targeted behaviour change interventions


Perth Children's Hospital
Cystic Fibrosis Clinic Sputum Audit
The percentage of children who provide no sample reduced by
23%
Total number of samples provided increased by
73%
40%
improvement in the number of kids providing 1 or more samples!
"We are all happy dancing around the bathroom as she just caught her first frog!"
Parent of 8 y.o. girl
Percentage who provided 4 or more samples
40
35
30
25
20
15
10
5
0
Pre
Post
6-8 year old females showed the best improvement
13-year-old plus boys have the most room for improvement
Pathogens identification rates were similar pre and post intervention.
(88% vs 87%)
1050
PATHOLOGY FORMS WERE CREATED!
51
CFWA prizes were collected with your completed frog passports!

5. Striving for Best Practice

The COM-B model, developed by Michie and colleagues, is internationally recognised as a gold-standard framework for behaviour change(Michie et al., 2011). It identifies that Capability, Opportunity and Motivation are three key factors that drive Behaviour(Michie et al., 2011). By adopting this model, the Perth Children's Hospital CF service demonstrated its willingness to learn from global research and apply proven techniques to local practice. This strategic alignment with evidence based, best-practice principles ensured that the intervention was both innovative and underpinned by sound theoretical principles.

While CF modulator therapies (disease modifying medications) have transformed clinical outcomes for many people with CF by improving lung function, symptoms, and quality of life, persistent lung infections remain a major challenge(Nichols et al., 2023). Importantly, even prior to the introduction of CF modulators, sputum sampling was difficult, with most children unable to reliably produce samples in clinic settings (Radhakrishnan et al., 2007). A comprehensive audit of sputum sampling rates at PCH, revealing that only 10% of children met the recommended target of four samples per year. This benchmarking exercise allowed the team to compare performance against national guidelines and identify a significant care gap, highlighting clinical variance in routine practice.

The COM-B model then provided a structured approach to improve this 'behaviour' of low sampling rates by enhancing Capability through targeted education, Opportunity through access to collection tools and resources, and Motivation through playful incentives, recognition, and celebration. What became clear was those previous discussions on the importance of sputum sampling, or once-off attempts during clinic visits, did not resonate across the CF community. The COM-B model guided the team to approach the problem with a focus not just on information, but on building capability, confidence, and skill in achieving the desired approach. By shifting from a "I can't do it" to a "I will keep practicing!" mindset for the patient, it reduced medical stress and feelings of failure around the process. The engagement of Pathology services to process all sputum sample attempts and CFWA to promote its importance outside the hospital environment were key factors in the program's success. The result was a substantial increase in children meeting the target, achieved without increasing hospital resources, demonstrating improved efficiency and effectiveness of service delivery.

INNOVATION IN PRACTICE AND PROCESS

The 'Year of the Frog' campaign represents an innovative approach to both clinical practice and system processes in the care of children with CF. Clinically, every member of the multidisciplinary CF team—including physiotherapists, nurses, doctors, lung function scientists, dieticians, and social workers—reinforced a unified message, ensuring a consistent, family-centred approach to sputum collection. By aligning clinician behaviours around a shared theme ("Have you caught a frog lately?"), the project reduced clinical variance, created a seamless and predictable experience for families, and embedded best-practice, guideline-driven care across the service.

From a system perspective, the campaign introduced structured process innovations that supported sustainable improvements in sputum collection. Frog-themed sputum passports, clinic packs, and community-linked incentives were co-developed with the peak consumer body, the Western Australian Cystic Fibrosis Association (CFWA), using consumer feedback and creative problem-solving. These tools transformed a traditionally clinical and potentially stressful task into a positive, engaging, family-friendly experience, making it easier for children to consistently achieve the recommended four annual samples. By embedding these tools into routine clinic workflow and linking clinic-based practices with home-based collection, the project sustained adherence to national guidelines without requiring additional hospital resources.

Internationally, strategies to increase sputum collection have often relied on invasive, resource-intensive procedures such as induced sputum, which can increase procedural anxiety in children with chronic disease. In contrast, this campaign de-medicalised the process, limiting medical stress and creating a joyful, interactive experience for children and families. Children now attend clinic wearing "frog gear" they have chosen themselves, remain amused and engaged by staff participation, and actively interact with the playful clinic environment, reinforcing positive behaviour change while achieving clinical goals.

The project's innovative approach has already inspired further enhancements, including tailored adolescent engagement strategies and expanded educational resources. Collaboration with CFWA added a community dimension, amplifying the reach of the campaign through prizes, promotion, and accessible resources, demonstrating how innovation in process can be strengthened through strategic partnerships. Together, these practice and process innovations have created a sustainable, patient- and family-centred model that changes how clinicians work, how the system supports care, and how children and families engage with guideline-based CF management.

APPLICABILITY TO OTHER SETTINGS

The 'Year of the Frog' campaign offers a practical blueprint for other health and community settings where behaviour change, consumer engagement, and low-resource innovation are needed. Many health services across state, national, and international centres face challenges in engaging patients with education, skills development, and the importance of routine sputum sampling. This is relevant across the spectrum of chronic suppurative lung diseases, including bronchiectasis, primary ciliary dyskinesia, and protracted bacterial bronchitis. At the World Bronchiectasis Conference (Brisbane 2025), the importance of regular sputum surveillance was highlighted as a key objective for improving disease management, demonstrating the timeliness and relevance of this campaign.

The COM-B model, underpinning this initiative, is particularly suited to enhancing self-management of chronic conditions, providing a structured, evidence-based framework that can achieve measurable outcomes in a budget- and resource-conscious way. By focusing on sustainable behaviour change, this approach may help reduce the broader economic burden of chronic disease on health systems while improving patient care.

The cohort participating in this project is demographically similar to most Australian paediatric tertiary CF services, suggesting that the intervention could be directly replicated in other centres. Furthermore, the principles, resources, and model of care developed for this campaign are transferable and could be adapted for other conditions that also recommend sputum surveillance, including bronchiectasis and primary ciliary dyskinesia, broadening its clinical impact.The campaign has already attracted interest from other CF centres nationally and internationally, with teams recognising that the approach could be implemented within their own services.

Many health services also struggle with low adherence to routine monitoring in other contexts, such as home physiotherapy programs or chronic disease management. The COM-B framework used here can be adapted to:

- Identify barriers to Capability (e.g., lack of knowledge or confidence)
- Create Opportunities (e.g., access to tools, reminders, community drop-off points)
- Build Motivation (e.g., gamification, celebration, peer modelling)

This structured, low-resource approach is especially transferable across paediatrics, aged care, rehabilitation, and chronic disease management, offering a proven pathway for sustainable improvements in patient- and family-centred care.

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APPENDIX

Appendix 1: Information to families about the importance of regular sputum collection and how to collect a sample

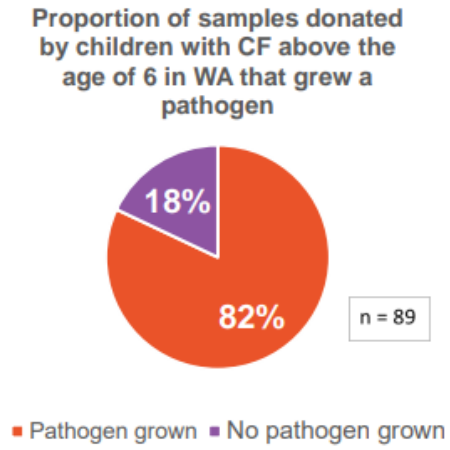
Perth Children's Hospital

Health Facts

Cystic fibrosis sputum sample collection

Did you know:

82% of kids with cystic fibrosis who gave a sample last year grew a bug in their sputum!



Why do we need to collect sputum samples?

Sputum samples detect and identify bacteria, viruses and fungi that may be found in your lungs.

Similar to regular lung function tests and the bronchoscopies you had when you were little, this helps to:

1. Identify the cause of your symptoms.
2. Prescribe effective antibiotics that target specific bugs/ pathogens.
3. Help track your progress.

Research tells us that kids taking Trikafta and gene modulator therapy still grow bugs even without having lots of sputum if any!

How often should I give a sputum sample?

Every 3 months, sometime before your next clinic appointment.

We know it can be difficult to get a sputum sample. Even one sample is better than none during the year.

How much sputum is enough?

We only need a small amount of sputum. Microbiologists make every effort to test each sample sent to the lab. 1ml of sputum ~1/5 of a teaspoon is enough.

This sputum may look like a small cloud or even clear white. It will probably be mixed with saliva/spit and can be hard to see but this is ok.

How do I collect a sputum sample?

1. Wash your hands.
2. Rinse your mouth with water.
3. Keep the lid on the sputum pot until you are ready. This helps reduce contamination with the environment.

4. Take a deep breath, then cough deeply and clear your throat. Doing your physio or exercise first may make it easier.
5. Spit the sputum into the sputum pot and put the lid on.
6. Write your name, date and the time you got the sputum onto the pot.
7. Keep the pot in the fridge and drop it to PathWest with your sputum form within 24hours. When transporting, keep it in a cooler bag.

Where do I drop off the sputum sample?

Date, time and sign your sputum collection form that you were given in clinic. If you don't have a form, email your cystic fibrosis nurses at pch.cf@health.wa.gov.au

There are 2 locations where you can drop your sample. This makes sure results can be accessed on our system:

- Drop it to your local PathWest collection centre.
- Drop it into Perth Children's Hospital PathWest, ground floor near the pink lifts Clinic B.

How do I find out my sputum sample results?

It takes 3-5 days for the sample to be processed and results to be available.

Please email your cystic fibrosis nurses at pch.cf@health.wa.gov.au to see if any results are available.

If it is close to your clinic date, please ask at your appointment.

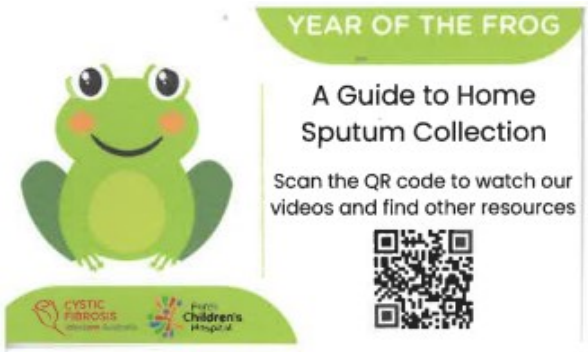
Appendix 2: 'Catching your Frog' Video and business card with video link given to children and families

How to 'Catch your Frogs' - QR Code

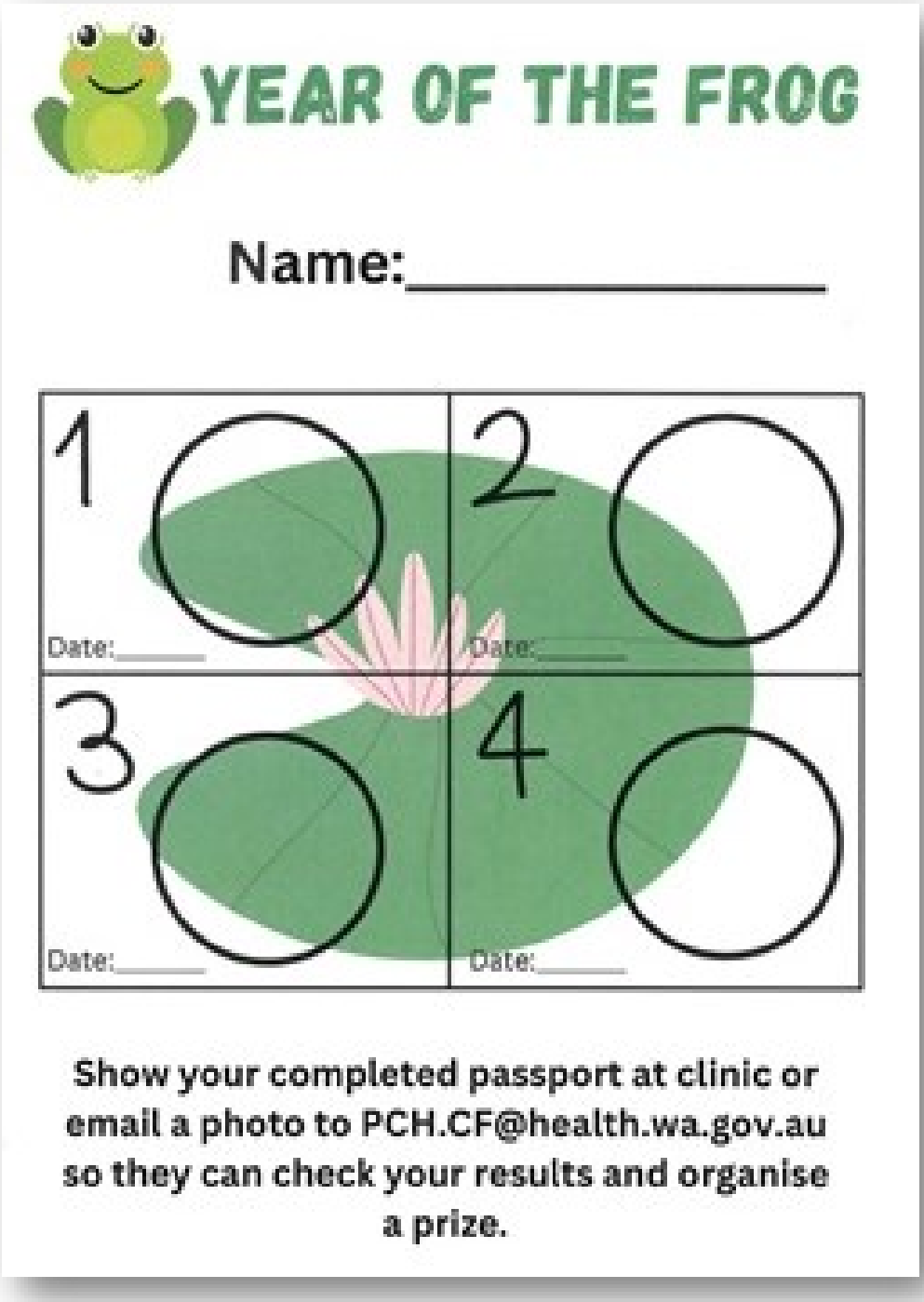
Our Year of the Frog collaborative project with PCH hopes to boost the number of families submitting regular sputum samples each year.

How to Catch Your Frogs is designed to help your child learn how to produce a sputum sample at home.

We Want Your Sputum is for older kids aged 12+ and encourages them to produce regular sputum samples.



Appendix 3: Sputum passport for children to record how many 'frogs' (sputum samples) they needed to collect to get a prize.



Appendix 4: 'Tips and tricks' handout given to families to assist in collecting home sputum samples

Perth Children's Hospital

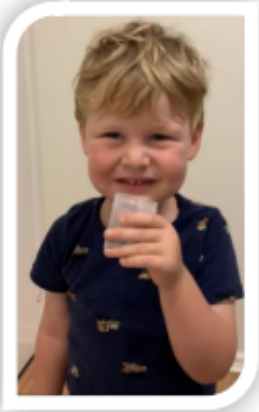
Health Facts

Tips and tricks for cystic fibrosis sputum sample collection

Children and young people can find it difficult to bring up sputum when they are well or on modulator therapy. Here are some tips and tricks to help you practice producing a sputum sample during physio, sport, play and in different environments. If you are having difficulty, please discuss this with your clinic physiotherapist.

How to practice getting a sputum sample:

During airway clearance (physio)…



- Do your regular airway clearance routine and practice with each huff and cough to spit out something.
- If you use hypertonic saline, it may help to try to huff and clear after this.
- Add in star jumps until you feel a little puffed. This helps to shift more sputum.
- Cuddle your pillow to help support your stomach muscles to make your cough stronger.
- Practice 'chicken wing' coughs to get more 'oomph' in your cough.
- Take a few big breaths followed by a strong cough, then repeatedly clear your throat. Aim to move something onto your tongue and then spit it out.

After exercise…

- After a sport that makes you puffed, have your huff tube and sputum pot ready to try some huffs and coughs.
- Some great exercise ideas include; football, netball, surfing, soccer, dancing, trampolining.
- Try cartwheels and handstands before huffing. This will help move secretions.

Try different games…

- Sing energetically! Try timing your huffs /coughs with a beat or lyric of your favourite song.
- Practice gargling water and spitting it out as far as possible (do this in your backyard!).
- Tickle wars can help trigger a strong spontaneous cough.
- Rocket/butterfly huffs with tissues; see how far they fly with your best huff technique.
- Play wrestling often leads to laughter and helps move sputum.
- Try hopscotch, skipping and bear crawls. These help the frogs inside your lungs escape!
- Practice blowing a ping pong ball across the table. Can you get it to the other side?

CLINICAL EXCELLENCE AND PATIENT SAFETY

TABLE OF SUBMISSIONS

Alfred Health, VIC

V.E.I.N.S.: Vital Education Improving Nursing Skills for PIVC Practices

Dilshani Hitihamy Koralage, Pauline Bass, Daniela Karanfilovska, and Marina Paspaliaris

Cabrini Health, VIC

Fighting Falls

Michelle Smart and Jodie Dooley

Canberra Health Services, ACT

A sustainable solution: Oral Paracetamol in preoperative care

Staicy Thekkanath

Child and Adolescent Health Services, WA

Quicker team launch times for urgent priority neonatal retrievals: A Quality Improvement Initiative study

Saumil Desai, Kevin George, Kylie McDonald, Alysha Timoney, Dahna Kelland, Stephanie Barr, Molly Carroll, David Lockhart, Olivia Peters, Matt Cooper, and Jonathan Davis

Donvale Rehabilitation Hospital, VIC

National Safety and Quality Health Service (NSQHS) Standards – Action 6.05: Communicating for safety at bedside clinical handover, consistently using three approved identifiers to confirm patient identification

Marjel Crotty and Alison Langley

East Metropolitan Health Service, WA

Co-HIVE: Meeting the Needs of an Aging Population Through Virtual Innovation

AJ Rajagopal, Zarrin Allam, Jonathon Burcham, and Samuel Weber

Eastern Health, VIC

Improving Care of the Older person in Emergency Departments through Rapid Delirium Screening

Dr Anita Liu and Box Hill Hospital

Eastern Health, VIC

Enhancing Emergency Department Flow to Deliver Better Patient Care Through Improving Short Stay Unit Optimisation

Andrew Maclean

Eastern Health, VIC

Reducing PIVC related Staphylococcus aureus Bacteraemias

Daniel Kim and Dr Sara Sparham

Eastern Health, VIC

Increasing Safety for Patients and Staff in the Emergency Department through Implementation of the Safewards Program

Jane Lukins, Laura Valentine, Susan Farthing, Kristel Ward-Stockham, Raewyn Szelag, and Patrick Owen

Epworth HealthCare, VIC

HealthTalk Connect: Improving patient experience and safety through the Point of Care system for patients with communication challenge

Lauren Fletcher, Prof Miranda Rose, Dr Marcella Carragher, A/Prof Robyn O'Halloran, and Edwina Lambourn

Gold Coast Health, QLD

Early Development & Engagement (EDIE) quality initiative

Rebecca Shaw

Hornsby Ku-Ring-Gai Hospital, NSW

Early access to intrapleural fibrinolysis therapy in a "B2" level peer hospital, with no dedicated high-dependency unit

Akiko Man

Hunter New England Local Health District, NSW

TIATRA: Telehealth Increased Access to Treatment in Rural Areas for people with Borderline Personality Disorder

Dr Carla Walton, Sharleen Gonzalez, Dr Katie McGill, Naz McGregor, Anna Dunbar, and Richard Brimson

Hunter New England Local Health District, NSW

Armidale MDT meeting – Timing of Birth

Joanne Humphris

Hunter New England Local Health District, NSW

Bladder control issues- Speak up. No shame. Help is available: a rural Aboriginal Community-led co-creation project

Di Marsden, Angela Knox, Tammy Baker, Amanda Styles, Mandy Cutmore, Karen Baker, Louise Morris, Rachel Peake, Aunty Ann Williams, Aunty Pam Meehan, Candice Dahlstrom, and Lynette Lackay

Hunter New England Local Health District, NSW

Knees Up: Maitland Rapid Knee Arthroplasty Project

Andrew Krause, Dr Nanda Kumar, Jemma Currie, Dr James Coulthard, and Dr Mac Daniel Nixon

Hunter New England Local Health District, NSW

Site-Right Cite-Right Sight-Right, Safe Cannulation for safe care

Dr Nanda Kumar Sakaleshpura Chandrashekar and Claire Brew

Karitane, NSW

'My Toddler and Me': a video series to promote toddler mental health and wellbeing among multicultural families

Lee Bratel, Erin Brandtman, Sue Morgan, and Jane Kohlhoff

King Edward Memorial Hospital, WA

Evaluation of the Acceptability and Feasibility of the Social Attention and Communication Surveillance-Revised (SACS-R) tool for Early Identification of Autism in Preterm Infants: The Identify and Act Study

Gayatri Jape, Sarah Pillar, Sudharshana Saminathan, Kexian Wu, Stephanie Sherrard, Emma Dudman, and Mary Sharp

Liverpool Hospital, NSW

Improving time from triage to commencement of clinical care

Daniel Van Vorst

Liverpool Hospital, NSW

HITH 4 HIPS

Justine Naylor

Mental Health Drug and Alcohol Northern Sydney Local Health District, NSW

Enhancing Safety in Practice: NBCMHS Pilot Launch of the Ventrogluteal IM Injection (VGIMI) Technique

Amy Jackson

Mental Health Drug and Alcohol Northern Sydney Local Health District, NSW

Transitioning from Paediatric to Inpatient to Outpatient Care for Anorexia Nervosa: A Brief Intervention

Simone Jaques and Penelope Uther

Mental Health Drug and Alcohol Northern Sydney Local Health District, NSW

Let's Talk About Voices – An Online Toolkit for Voice Hearers and Supporters

Lyndal Sherwin

Mental Health Drug and Alcohol Northern Sydney Local Health District, NSW

Behavioural Expectations in Adolescent Inpatient Units

Matteo Zuccala, Sophie O'Keefe, and Roman Kielich

Mental Health Drug and Alcohol Services, Royal North Shore Hospital, NSW

Medication Reconciliation IDAS (Inpatient Drug and Alcohol Services) QI Project

A/Prof Mark Montebello, Zehra Tugcu, Ashley Qian, and Judy Lee

Metro North HHS – Surgical Treatment and Rehabilitation Services (STARS), QLD

Revolutionising Post Operative Care with PODSS

Kara Gadischke, Rebecca Pickering, Jane Holt, and Melanie Ullner

Metro North Hospital & Health Services – The Prince Charles Hospital & Mental Health Services, QLD

Enhancing Cognitive Recovery and Reducing Readmissions in Older Adults: TPCH Post Delirium Follow-Up Service

Khera Kim, Dr Lucy Dakin, Sarah Bold, Dr Sarah Fox, and Kevin Clark

Northern Health, VIC

Northern Health: Multidisciplinary clinic for Motor Neurone Disease

Anna Connolly and Andrea Gow

Northern Territory Health, NT

Crisis Response Intake Team (CRIT) and supporting resources

Morgan Lane and Rhianon Hutcheson

Northern Territory Health, NT

Transforming Mental Health Care: Reducing Aeromedical Transfers through Community-Based Innovation

Jane Hair, Andrea Flanagan, Nicholas Bracey, Gavin Bell, Kelly Dhaemer, and Femi Ogeleye

Perth Children's Hospital, WA

"Year of the Frog": A campaign to address the challenges of regular sputum surveillance for children with cystic fibrosis

Crystal Bourke, Julie Depiazzi, Noula Gibson, Laura Cinanni, Jizelle Kenworthy-Groen, Eloise Connell, Alison Stone, Charlotte Burr, Andre Schultz, and David Hancock

Perth Children's Hospital, WA

Improving Communication in Critical Bleeding events in ED aids staff empowerment

Rebecca McLean, A/Prof Tina Carter, Elizabeth Fong, and Sarah Harris

Prevention and Response to Violence, Abuse, and Neglect (PARVAN) NSLHD, NSW

Lorikeet Clinic: A Novel, Integrated, and Survivor-Led Model for Domestic and Family Violence (DFV) Care

Daena Wilson

Primary and Community Health NSLHD, NSW

Lung Cancer Rehabilitation

Pauline Kemp

Riverland Mallee Coorong Local Health Network, SA

Standardisation of Resuscitation Trolleys across a rural health network leading to improved case, better patient outcomes and reduced stock wastage

Dr Caroline Phegan, Dr Kirstie Morandell, Karen Hollitt, and Kim Speziali

Royal Flying Doctor Service Tasmania Ltd, TAS

Using Clinical Case Presentations to Support a Culture of Shared Learning and Continuous Improvement

Lisa Lord and Nicole Henty

Royal North Shore Hospital, Northern Sydney Local Health District, NSW

You and Your Surgery Clinic (YaYS): Embedding Shared Decision-Making in a Multidisciplinary Pre-Surgical Clinical at Royal North Shore Hospital

Dr Andrew Marks, Alana Maky, Dr Kanika Chaudhri, Dr Naomi Pallas, Thien Kim Nguyen, Sophie Lange, and Dr Adam Rehak

RPA Virtual Hospital, NSW

Pioneering nurse-led medication reconciliation: forging a collaborative pathway to medication safety

Vickie Zhang and Dr Adrian Boscolo

Ryde Hospital, NSW

Improving Acute Swallow Screening in Stroke and Transient Ischaemic Attack (ASSIST) completion rates in the Emergency Department (ED)

Simpy Arora

Ryde Hospital, NSW

Supporting and training staff to improve assessment and discharge planning for NDIS participants through an Acute care multidisciplinary case conference

Philippa Wilford and JoAnne Wigan

SA Ambulance, SA

Implementation of an organisational-wide quality improvement program at SA Ambulance

Amy Keir and Michelle Thomson

SA Ambulance, SA

Obstetric Emergencies & Newborn Management

Dylan Milde

St John of God Murdoch Hospital, WA

St John of God Murdoch CARE program

Cate Thomas and Anna Mulholland

St John of God Warrnambool Hospital, VIC

Improving patient safety and harm from falls using a multifaceted approach

Leanne McPherson, Rebecca White, Laura Bourke, and the Comprehensive Care Committee

St Vincent's Hospital Network, NSW

Reducing Hospital Acquired Complications (HAC) Initiative

Karen McDonell, Francesca Schiavuzzi, Travis Brown, Alex Capraro, and Dr Rajdeep Ubeja

St Vincent's Hospital Melbourne, VIC

Speak Up! Increasing Feedback from Non-English-Speaking Patients

Claire Formby, Helen Easterby, Denise Currie, Teena Getulio, Andrea Forster, Meg Marmo, Catherine White, Kathryn Bailey, Lena Argyropoulos, Helena Spyrou, and Kelly Mullins

SWSLHD Campbelltown and Camden Hospitals, NSW

Introduction of a Comprehensive Pharmacy Education service to Cancer Patients at Macarthur Cancer Therapy Centre

Vy-vy Tran

Sydney Local Health District

Rethink, Re-prioritise, Re-design: Transforming Equitable and Safe Access to Child and Family Health Services through new Model of Care and Digital Solutions

Naome Reid, Rachel Walker, Janice Oliver, Dianna Jagers, Anna Kearns, Sue Woolfenden, Dimitra Kaldelis, Jessica Earley, Paola Gordon, Rebecca Karmas, Divija Diwakar, and Calvin (Kee Fung) Lee

Western Health, VIC

Rationalizing the use of Additional Care Resources. A better way towards safe outcomes for staff and patients

Karen Garratt, Monique Sammut, Karen Rog, Kellie McWilliams, Kellie Vivekanantham, Shane Crowe, and Joanne Mapes

Westmead Rehabilitation Hospital Aurora Health, NSW

Falls Prevention Project-Enhancing Safety Through Strategic Monitoring and Individualised Care

Anne Renshaw

Wide Bay Hospital and Health Service, QLD

Fraser Coast Mental Health Unit - Designed for consumers, by consumers

Bryce Maguire, Stacey Cooper, Fiona Prescott, Brayden Rodgers, and Renata Trapp

SUSTAINABLE HEALTHCARE AND SERVICE DELIVERY

WINNER

Eastern Health, VIC

Support Services

Improving food service safety and food waste in Emergency and Short Stay Departments

Warwick Millard

AIM

The aim of this project is to assess the current level of food waste, patient satisfaction and safety of the food system within the Emergency Departments and Short Stay Unit at Box Hill Hospital where the electronic menu management system is not functional. This data will be used to design and implement a food system that reduces food waste through improved patient engagement and meal ordering capacity whilst simultaneously improving patient safety.

SUMMARY ABSTRACT

Background:
The food service system to the Emergency Department (ED) and Short Stay Unit (SSU) at Box Hill was considered a patient risk, particularly for food allergies and modified textures, and was noted to have increased food waste compared to the rest of Eastern Health. The electronic menu management system (EMMS) is not available in the Emergency Department and was not used in Short Stay due to significantly high patient turnover averaging 4 changes daily.

The meal delivery system was provision of 36 full ward default hot meal trays provided for breakfast, lunch and dinner. Kitchen staff identified meals to be delivered to patients using a laminated sheet of paper marked with a tick next to a bed number (Appendix 1). Kitchen staff also reported that this sheet was commonly left outdated, meaning they did not know who to provide meals to. This service delivery method provided no capacity to complete a 3-point ID check. This saw an increased number of incidents where patients with food allergies or requiring a modified texture received incorrect meals compared to the rest of the hospital. In addition to this, the kitchen reported significantly higher levels of plate waste within ED and SSU compared to the rest of the hospital.

Method:
A working group was established including Director of Support Services, Food Service Manager, ED/SSU leadership and Food Service Dietitian.

A project was undertaken with support of the Monash University dietetic food systems student placement in September 2024. The project was undertaken over 4 days investigating plate waste collection at breakfast, lunch and dinner, combined with patient surveys outlining preferences for snacks, light meals or a full meal tray. Patient surveys (Appendix 1) were completed across all meal services during the 4 days of data collection. This presented patients with an opportunity to express their preferences for meal provision whilst present in either ED or SSU.

Results of the surveys highlighted patient preference for light meals, and the waste assessment projected annual plate waste to be more than 4500kg at an estimated cost of $50,000 (Appendix4). In addition to the patient surveys, this evidence was used to inform the working group why hot meals were significantly more wasted within this patient cohort

Following benchmarking against the meal provision systems in comparative ED and SSU departments around Victoria, the working group determined the ideal system was to provide default light meals consisting of products with allergen information on labels. Hot meals were approved to be ordered for specific circumstances such as:

- Admission greater than 12 hours
- Patients with food allergens or requiring modified textures
- Elderly
- Clinically indicated, for example, type 1 diabetes.

An ad hoc meal order form was developed for hot meals to include 3 points of ID, Patient diet code, allergies, dislikes, intolerances and special comments. This design also includes automated email delivery to the menu monitors for efficiency (Appendix 3)

Prior to the change implementation, significant consultation was undertaken between kitchen management, ED, and SSU leadership, and support services. A clear communication plan was followed to ensure staff training regarding the changes, the new process, and reasoning. This collaboration was integral to designing a food service model within this complex environment that was effective and sustainable.

Once this process was implemented, the exact same project was re-completed with Monash University food systems placement students again in May 2025. Below are the results of the re-completed project.

Results:
Results from the re-completion of the project predict food waste to be reduced by approximately 30% and financial saving of approximately $60,000 per annum, exceeding the original estimation of $50,000 (Appendix 5). The financial savings would be increased with the addition of expenses incurred to remove the additional food waste prior to the changes, particularly with the increase in landfill waste taxes July 1, 2025.

The re-completed patient surveys identified that there was an increased desire by patients to receive a hot meal during this project compared with the original. Some reasons for this are likely associated with colder weather, hospital capacity and patient turnover, or because the patients were not receiving hot meals so they would like that option. However, during the re-completion of the project, there was an average of 8-10 hot meals ordered per lunch and dinner services equating to a production cost saving of approximately $180 daily.

Since the introduction of the ad-hoc meal ordering three months prior to the re-completed project, there have been no incidents of meals provided by the kitchen at Box Hill to ED/SSU that have resulted in a patient with food allergies or requiring an incorrect texture receiving an unsafe meal. This is noted to be a considerable improvement. Print the bulk emails in one go whilst completing other tasks. The system has also improved the traceability of meal delivery if there have been any concerns.

The final notable result is the feedback received by nursing staff. Positive discussion has been had regarding the improved efficiency and simplicity of this process. Nurses have also anecdotally reported to kitchen staff that their patients are much happier with the new meal provision options. Kitchen management has also expressed satisfaction with the efficiency of this change. They no longer have to man a phone to receive orders and emails. They can

Conclusion:
This project is innovative in several ways. Firstly, Eastern Health (EH) has established an efficient, effective, and safe Ad Hoc meal ordering system that improves patient safety, meets National Safety & Quality Health Service standards, and has capacity to work anywhere in Eastern Health where the menu management system is not implemented. This system also has future capabilities to work across all wards at EH when late admissions or dietary changes have missed ordering cut off times in the EMMS. This system has a traceable order history and significantly improves safety and work processes compared to previous phone orders or paper trails.

Additionally, the project successfully incorporated patient engagement and patient tray waste into a quality improvement project resulting in significantly improved outcomes for EH and their patients. This project style has significant potential to improve patient menu satisfaction and reduce food waste in any area of care across any healthcare organisation.

REPORT

APPLICATION OF ACHS PRINCIPLES

1. Consumer Focus

1. Consumer focus has been a priority during the lifespan of this quality improvement project. The project undertook patient surveys to gain their preferences to advocate for the change in meal delivery to the Emergency and Short Stay Unit. These surveys have been completed pre and post implementation and will be completed again in the future for any further refinement.
2. The project was designed to improve patient choice for meals in an area of the hospital where there was previously no patient choice. The concept is that to reduce waste EH needs to provide food that their patients want to eat. The old model did not allow for this and was seeing significant waste as a result.
3. Finally, the project was designed to improve safe patient meal delivery. This was achieved through improving meal ordering and delivery capacity where the EMMS was not functional by enabling 3-point ID checks at point of delivery. This introduction has significantly reduced the risk to patients requiring a specific dietary modification such as modified textures, allergy free or therapeutic meals such as gluten free for coeliac patients, and improved confidence of the food service staff that they are providing safe meals to the appropriate patients.

2. Effective Leadership

This project has shown effective leadership throughout its lifespan.

1. It has effectively implemented multiple changes across multiple workforces to improve patient meal delivery in ED & SSU. This has required combined leadership and collaboration between food service and nursing management to empower their teams, educate staff on the importance and encourage them to provide input to ongoing refinement and improvement to this system.
2. This project design has listened to innovative ideas and implemented several of them. An example is including the use of Microsoft Power Automate to support automated email delivery to the kitchen once submission of the order by nursing. This innovation has improved efficiency for nursing staff eliminating the phone calls and emails between the kitchen and Nurse Unit Managers (NUMs). Following feedback from the clinical teams, the removal of the QR code and the uploading of the link to the meal ordering form as an app on the EH intranet page has been completed.
3. Throughout the implementation phases, all parties have been encouraging staff to provide feedback to the working group to continually improve the system. Continual leadership meetings have been held between nursing leadership and kitchen leadership to troubleshoot issues.
4. This project has driven directional change to improve meal ordering, delivery and food system in ED & SSU. In addition to this, nursing has requested the expansion of this process across all wards for instances where late meal orders/diet changes after the cut off times in the EMMS are required. This request has been made to improve efficiency to nursing workflow whilst improving safety.

3. Effective Leadership

This project highlights continuous improvement within Eastern Health's food system in several ways.

1. This change highlights the importance of patient engagement leading to increased patient menu satisfaction resulting in reduced food waste and improved financial outcomes.
2. This project has improved efficiency through reducing the time spent by both clinical and food service staff on the phone, completing and delivering paper forms, or sending emails to the kitchen to order meals for patients in ED & SSU.
3. This project has implemented an effective system that meets the NSQHS standards (1) for patient identification but also meets the National Allergy Strategy best practice guidelines (2).

4. This process has also supported improved invoicing as they were previously manually calculating meals provided. The system automatically calculates the meals ordered at each service supporting accurate invoicing for the departments.

4. Evidence of Outcomes

The evidence of outcomes has been noted in several areas.

1. The initial evidence of outcome was noted during the recompletion of the 4 days plate waste data collection in ED & SSU highlighting a reduction in food waste by approximately 35% and significant financial savings to Eastern Health of approximately $60,000 annually.
2. In addition to this, Box Hill utilises an Artificial Intelligence (AI) waste camera situates in the dishwasher room to record tray waste averages across Box Hill hospital which has seen a reduction in waste in ED & SSU since implementation of this change. The data obtained by this method confirms a reduction in total plate waste at Box Hill since the implementation of this change. The technology cannot distinguish waste reductions specifically for ED/SSU at present to confirm the 35% reduction using manual waste collection completed by the student projects.
3. The improved safety has been evidenced through the reduction in VHIMs incidents reported for incorrect and unsafe meal delivery in ED & SSU. It is noted that there have been no incidents reported for patients receiving unsafe meals, particularly including food allergens or incorrect diet textures when required.

5. Striving for Best Practice

This project is quite novel due to the combined use of Microsoft Forms and the Power Automate program to support improved communication of meal orders. The introduction of this system has supported Eastern Health to implement an electronic menu ordering system in ED & SSU where this was previously not functional or capable. This is a common issue across healthcare organisations. This project can support other Healthcare organisations that struggle in this area.

In addition to this, we determined the failings of the previous food system and reasons why plate waste was increased in these areas through conducting patient surveys. With this, we were able to implement a more satisfying, sustainable and safe food system in ED & SSU. The introduction of the 3-point ID for meal orders improves Eastern Health's adherence to the NSQHS standards (1) and the National Allergy Strategy best practice guidelines for safe meal delivery for patients with food allergens.

INNOVATION IN PRACTICE AND PROCESS

This project is innovative in several ways:

Firstly, the previous food system in ED & SSU did not meet the 3 points of ID screening requirement for meal delivery outlined in NSQHS standard 5 (1). In addition to this, the previous model of meal delivery did not meet the Australian National Allergy Strategy - Food allergen management in food service best practice guidelines (2). With this change, the meal delivery system now meets both the NSQHS (1) and the National Allergy Strategy best practice guidelines (2). With this, we are confident that the safety of our patients has significantly improved, which has been identified through the reduction of food related incidents in ED & SSU.

Secondly, the project application of gathering patient preferences combined with waste data to advocate and implement food system and meal delivery changes has resulted in a menu system that we are confident improves patient satisfaction but is also significantly more sustainable and cost effective to Eastern Health aligning with their strategic goals.

As outlined through the rest of this application, the introduction of the automated meal order sheet being sent to the kitchen has improved efficiency of meal ordering resulting in improved workflow for nursing teams in ED & SSU and the kitchen teams. The automated meal order calculations have improved invoicing where it was previously completed manually.

APPLICABILITY TO OTHER SETTINGS

The Ad Hoc meal ordering system has capacity at Eastern Health wherever the EMMS is not in place. This includes all three Emergency Departments and Short Stay Units. The implementation of this system is already underway at Angliss ED & SSU and will be followed by Maroondah. I addition to the ED & SSU's, the Ad Hoc meal ordering can be implemented in other day areas including dialysis and day oncology.

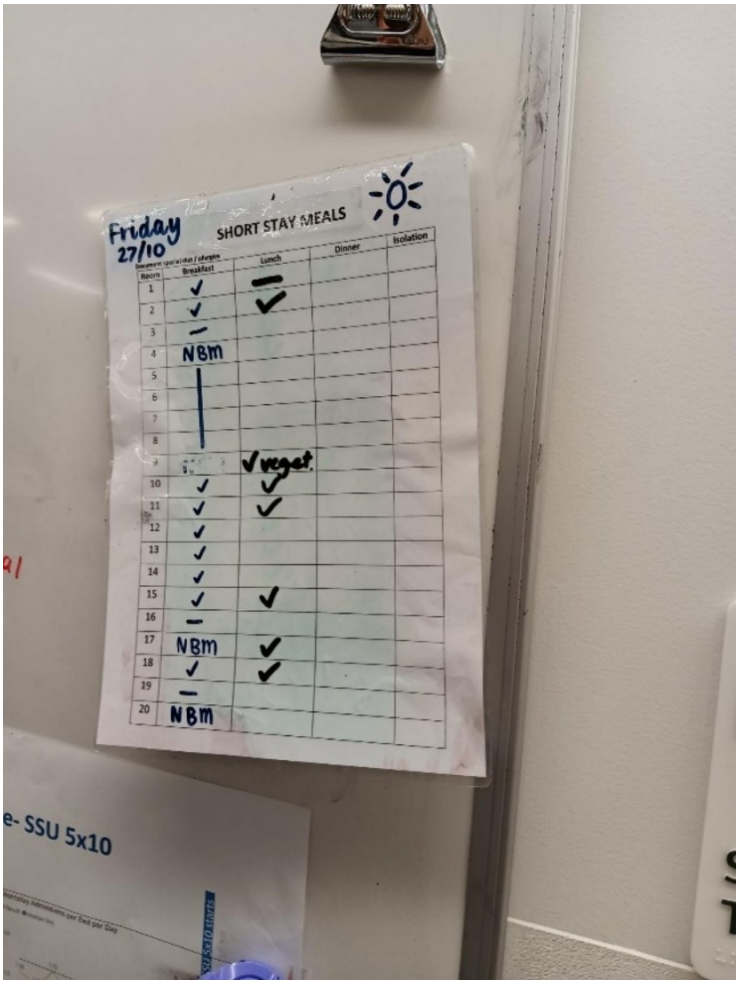
There is opportunity for this ordering system to be implemented for ad hoc orders organisation wide at a ward. Currently ad hoc orders are completed via phone calls and emails by nursing to the kitchens when there is a late admission or a diet change after the cut off times programmed in the EMMS. The implementation of this Ad Hoc form in EDS & SSU has already encouraged Nurse Unit Managers request this be implemented for them to use to improve their efficiency through reducing time spent on the phone by nursing to call the kitchen and emailing them.

REFERENCES

1. National Safety & Quality Healthcare Services standards: The NSQHS Standards | Australian Commission on Safety and Quality in Health Care
2. National Allergy Strategy: Food Allergen Management in Food Service best practice guideline . Food_Allergen_Best_Practice_Guideline.pdf

APPENDIX

Appendix 1: Original ED/SSU meal ordering sheet



Appendix 2: Patient preference survey

Hi,

We are currently undertaking a project at Eastern Health investigating the current food service system within Short Stay and Emergency. We are seeking input from admitted patients within these departments through asking you to participate in a quick one-minute survey. This survey is voluntary, results are anonymous, and you are not required to participate if you do not wish. Please answer the questions with how you are feeling right now.

Would you like to proceed?

What department are you currently in? (Please circle) Short Stay or Emergency

What meal service is this (Please circle) Breakfast Lunch Dinner

If you required breakfast, what meal option would you prefer to receive?

1. A full tray with cereal, bread, spreads, fruit, juice and a hot drink?
2. A light option of cereal, milk and juice?
3. Snacks such as yoghurt, biscuits & cheese or sweet biscuits?
4. Nothing, I am not hungry

If you required lunch or dinner, what meal option would you prefer to receive?

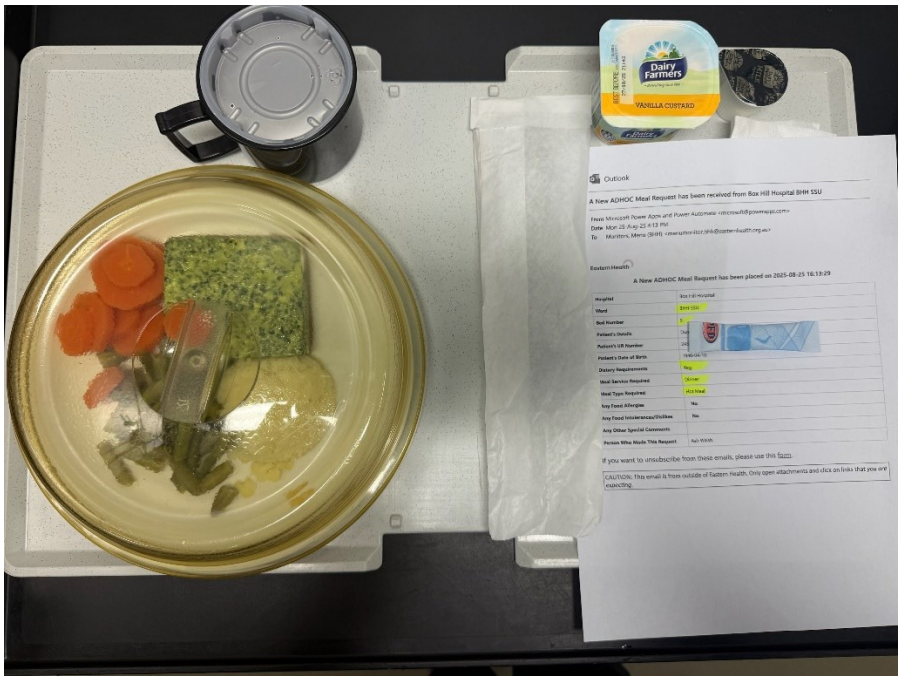
1. A hot main meal and dessert?
2. A sandwich and a light dessert such as jelly or ice cream.
3. Snacks such as biscuits & cheese, sweet biscuits, Jelly or yoghurt?
4. Nothing, I am not hungry

Appendix 3: Ad Hoc Meal form tray ticket example

Eastern Health

A New ADHOC Meal Request has been placed on 2025-08-22 11:07:29

Hospital	Angliss Hospital
Ward	AH ED
Bed Number	R1
Patient's Details	**Example**
Patient's UR Number	**Example**
Patient's Date of Birth	1956-03-11
Dietary Requirements	Reg
Meal Service Required	Lunch
Meal Type Required	Hot Meal
Any Food Allergies	**No**
Any Food Intolerances/Dislikes	**No**
Any Other Special Comments	
Person Who Made This Request	G Sands



Appendix 4: Original student project report (September 2024)

ED + SSU Project Summary

During our food service placement at Eastern Health (Box Hill), we were directed to conduct a waste audit and complete a patient survey for the Emergency Department (ED) and the Short Stay Unit (SSU). The purpose of the waste audit was to collect data of delivered/consumed (meals that have been eaten) and untouched meals to contribute for the re-evaluation and improvement of the current food system. Similarly, the survey we completed was relating to patients' food preferences about what size meal they would prefer. These results will also be used to prevent further food waste and streamline the current food service in both ED and SSU. After four days of data collection, we analysed the data to interpret any trends in food waste items and patient preferences to identify improvement areas and develop potential interventions.
Current barriers in ED and SSU

Due to the more unpredictable nature of the ED and SSU in terms of patient's circumstances and differing length of stay, food services can be more difficult to streamline. Prior to the commencement of this project, multiple barriers had been raised by staff in regard to service and ensuring patient safety:

- The current ordering system: Nurses use a different food ordering system to the rest of the hospital. A laminated form is ticked to imply the patient wants a meal rather than utilising ChefMax. Nurses often forget to fill this form out making it more difficult for the food service staff to deliver the correct food items to the right patient.
- Increased patient risk: There is currently no appropriate system in place to cater for allergies and diet codes. As ED and SSU do not utilise ChefMax, the kitchen is informed via email or phone call of any allergies or relevant diet codes. This leaves a large margin of error in relation to patient safety.
- The eating environment: The ED patients effectively have no stable trolley to eat a hot meal on. This makes eating the meal more difficult and can also compromise patient safety.
- Resistance to change from staff: The kitchen staff and management have been met with resistance from the nursing staff in regard to introducing new policies and processes to reduce waste and improve food service

Data overview:

For the food service system survey, 176 patients were consulted regarding their meal preferences over the 4 days, with 46% from the ED and 54% from the SSU.

A total of 432 default meals were distributed, with 376 meals (87%) returned and recorded over four days (Thursday, Friday, Monday, and Tuesday). Of the returned meals, 33% were from the ED (125 meals), and 67% were from the SSU (251 meals). The waste percentage from consumed/delivered meals was 39% for breakfast, 36% for lunch, and 31% for dinner. The SSU had a 3% higher wastage rate compared to the ED. Additionally, untouched meal waste accounted for 18% of the total returned meals, comprising 16% of breakfasts (22 meals), 14% of lunches (18 meals), and 26% of dinners (29 meals).

Breakfast:
Food service system survey: 47% of patients in ED and SSU preferred a lighter breakfast, like cereal, compared to a full tray (45% and 43%, respectively).
Delivered meal waste: The most wasted breakfast items were prunes (2,885g, 72%), diced mixed fruit (1,140g, 60%), porridge (5,468g, 52%), and sliced bread (46%). Tinned fruit had the highest waste rate (57%), while cereal had the lowest (32%).
Untouched meal waste: 16% of breakfast trays were returned untouched, amounting to 22 trays over four days, costing $80.

Lunch:
Food service system survey: 48% of ED and 50% of SSU patients preferred a lighter lunch, like a sandwich, compared to a hot meal with dessert (43% and 47%, respectively).
Delivered meal waste: The most wasted lunch items were wedges (1,045g, 62%), pudding (250g, 64%),

and fish (2,101g, 46%). Protein components were the most wasted overall (49%), while desserts had the least waste (20%).
Untouched meal waste: 14% of lunch trays were returned untouched, amounting to 18 trays over four days, costing $171.

Dinner:
Delivered meal waste: The most wasted dinner items were beef (430g, 71.67%), quiche (549g, 62.39%), and mixed vegetables (445g, 45%). Overall, the protein component was the most wasted (37%) and starch the least (25%).

Untouched meal waste: 26% of dinner trays were returned untouched, equating to 29 trays over four days, costing $275.
Overall:

Overall, chilled custard had the least wastage at 12.8%, making it the most well-received item, while prunes had the highest wastage at 72%. Total waste was 39% for breakfast, 36% for lunch, and 31% for dinner, equalling 50 kg over four days. Extrapolated annually, this would lead to approximately 4,500 kg of wasted food. Over the four days, 69 trays were returned untouched or undelivered (48%), costing $526, which could amount to around $47,000 per year.

Appendix 5: Second student project report (May 2025)

1. Actions conducted

A four-day meal waste audit was conducted in the Emergency Department (ED) and Short Stay Unit (SSU) at Box Hill Hospital (BHH) to assess changes in food waste following the implementation of the Light Ward Diet (LWD)-only menu. The audit also revisited patient preferences regarding menu options in both ED and SSU.

The results of the audit and patient preference survey, along with relevant recommendations, were presented to key stakeholders through a meeting and this executive summary.

2. Key findings

2.1 Organisation information

Since its establishment in 2000, Eastern Health has served the eastern metropolitan region of Melbourne, providing a comprehensive range of healthcare services, including hospital care, community health, and specialist services (1). Guided by its core values of respect for all, safe practice, strong partnerships in care, and a commitment to continuous improvement, Eastern Health is dedicated to delivering patient-centred care and collaborating closely with other healthcare sectors to meet the diverse needs of its community (2).

Box Hill Hospital, the largest acute hospital within the Eastern Health network, offers a wide range of healthcare services, including emergency care supported by short stay units.

2.2 Background

SSU and ED are the two hospital departments that are not applicable to utilise the menu management system of Eastern Health due to rapid changes of bed arrangement During COVID, the two wards have been serving hot meals and LWD to suit patient preference and longer stay in the hospital. This practice continued after the pandemic, and previous waste assessment noted a significant amount of food waste was generated in ED and SSU of BHH, considering that 4500 kg of waste was produced each year and approximately 50% of the main meals was minimally consumed. To improve menu management and minimise food waste, ED and SSU of BHH have now switched back to serve LWD only while patients are allowed to request hot meals if required.The purpose of this project is to conduct the meal waste assessment and review the changes in waste production after implementing the LWD only menu in ED and SSU.

2.3 Key stakeholders

The key stakeholders are as follows:

a. Director of Operation Support Service

b. Support services manager

c. Senior food service dietitian

d. ISS kitchen manager and food service staff

e. ED & SSU nurse manager

2.4 Objectives

2.4.1 To determine the waste in percentage of elements provided at Breakfast, Lunch and dinner in ED and SSU over a 4-day period

2.4.2 To assess patient preference of options in ED and SSU

2.4.3 To recommend appropriate plan considering patient feedback to improve satisfaction and reduce waste through providing appropriate numbers of certain options each meal

2.5 Method

2.5.1 Meal waste assessment

The food waste from breakfast, lunch and dinner were collected by food service assistants (FSA) using trolleys and assessed by four student dietitians in ED and SSU of BHH over a 4-day period. The audit analysed every component of patients' returned tray by investigating leftovers using fractions and compared against the reference tray to calculate the waste volume. The proportion of total waste from each component and each meal were determined and summarised across 4 days. The data was then used to compare with the data from last year to evaluate the changes in waste production and cost.

2.5.2 Patient preference survey

Surveys were performed by student dietitians to evaluate the patient's preference of menu options provided in ED and SSU which varied from different meal sizes including main meal tray, sandwiches and a light dessert or light snacks. The data were entered into an excel spreadsheet and summarised the proportion of patients selecting each meal option.

2.6 Results

2.6.1 Limitations

Data was collected over a 4-day period without weekends data captured, which limited the accuracy in representing the food wastage trend over a longer period.

Unreturned and undelivered meal trays were excluded in the analysis, as an unknown proportion were consumed, recycled or redelivered. Identification of trays collected from exclusion areas like paediatrics ward was limited due to uninformed change in food service staffing that prevented observation of tray collection. Certain food packages including sandwich boxes and dessert containers were missing on some returned trays. This may have resulted from patients retaining unfinished food items at bedside or from FSA being unfamiliar with the project and discarding parts of the packaging as routine tray collection. These factors likely led to an underestimation of food waste, lowering the validity of data due to uncertainty around food consumption from both unreturned trays and those with missing packaging.

Inconsistencies in meal components and discrepancies in portion sizes were identified between the actual delivered meals and the reference meals. It was observed that a proportion of meal trays contained two desserts instead of one, and mismatches were noted between the weight of served meals and the reference values. These variations have potentially affected the accuracy of food wastage measurement.

There were multiple factors affecting the food consumption trend that are uncontrolled, such as patient's demographics, medical conditions, cultural-related food preferences, ages and environmental factors such as temperature.

2.6.2 Meal waste analysis

The analysis of data aimed to explore key contributors of waste, this included, undelivered trays, specific meal items and the contribution for each meal service. '

Undelivered trays

Undelivered tray			
	Undelivered Tray	Prepared tray	Percentage
BFast	15	144	10.4%
Lunch	14	144	11.8%
Dinner	10	139	7.2%

Table 1. Undelivered tray

A total of 427 meals were prepared, with 265 meals (62%) returned and recorded. 42 meals (9.8%) were undelivered and returned to the kitchen, costing $1,773 per year.

2.6.2.1 Waste Data Overview

2.6.2.2 Breakfast

Estimated average food waste per day in ED & SSU at Breakfast					
	2024		2025		Changes
Food Items	Waste (g)	Percentage (%)	Waste (g)	Percentage (%)	
Cereals	1449.5	49.8	297.8	45.0	-4.8%
Tinned Fruits	1337.5	59.4	1287.5	47.7	-11.8%
Juice	685.0	34.1	729.0	29.4	-4.6%
Tea/ Coffee	NA	NA	24.9	62.9	NA
Dairy	1907.8	45.8	1285.0	38.1	-7.8%
Grains	155.3	38.8	306.3	44.1	5.3%
Spread	420.3	50.5	371.9	53.3	2.8%
Total	2024		2025		
Total Waste per year (kg)	2173.7		1570.3		-27.8%
Total Cost per year ($)	NA		5876.5		NA

Table 2. Estimated average food waste per day in ED & SSU at Breakfast

By comparing food waste percentage per food item , the most wasted food item in breakfast was tea bags/ coffee sticks (62.9%, 24.9g), and the least wasted item was fruit juice (29.4%, 729g). From the perspective of weight, the most wasted item was tinned fruits (1287.5g, 47.7%), followed by dairy items (1285g, 38.1%), and the lightest wasted item was tea bags/ coffee sticks (24.9g, 62.9%). Compared to results from 2024, the total weight of breakfast wastage was reduced, and the estimated total waste per year was reduced by 27.8%. It was also estimated that $5876.5 will be wasted in a year due to the food wastage from breakfast.

Sub group analysis: percentage (%) of wastage		
	BF with one slice of bread	BF with two slices of bread
Bread	36.0	49.1
Total Cereals	39.0	58.1

Table 3. Sub-group analysis of Breakfast

During the 4-day data collection period, breakfast on the third day (5th May) was served with two slices of bread, while the breakfasts on the remaining days were served with one slice. A sub-group analysis was conducted to analyse whether the extra slice of bread contributed to a reduced consumption of cereals, another carbohydrate source of breakfast. On the day when breakfast was served with 2 slices of bread, the wastage percentage of bread (49.1%) and cereal (58.1%) was higher compared to the other days (bread wastage: 36%, cereal wastage 39%).

2.6.2.3 Lunch

Estimated average food waste per day in ED & SSU at Lunch					
	2024		2025		Changes
Food items	Waste (g)	%	Waste (g)	%	
Dessert/Fruit	NA		1129	42.5	NA
Hot meals					
Main Protein/Main	4965	45	330	22	-23%
Main Starch	3211	37	453	29	-8%
Main Vegetables	4738	35	385	22	-13%
LWD					
Sandwiches	NA	NA	1105	36.9	NA
Total	2024		2025		
Total Waste per year (kg)	1431		921		-35.60%
Total Cost per year ($)	23893		15612		-34.70%

Table 4. Estimated average food waste per day in ED & SSU at Lunch

When comparing the percentage of waste by food item, the most wasted item was dessert/fruit (1,129g, 42.5%), followed by sandwiches (1,105g, 36.9%). In contrast, the least wasted items were components of hot meals-starch, protein and vegetables (29%, 22% and 22% respectively). Compared to the previous data, there was a 35.6% waste reduction which was mainly attributed to a decrease in the number of hot meals served. The cost of waste for lunch this year was $15612, representing a 34.7% reduction from the previous year.

2.6.2.4 Dinner

Estimated average food waste per day in ED & SSU at Dinner					
	2024		2025		Changes
Food items	Waste (g)	%	Waste (g)	%	
Dessert/Fruit	1786	37	1063.13	44	7%
Hot meals					
Main Protein/Main	1965	35	480	51	16%
Main Starch	1455	21	376	22	1%
Main Vegetables	2559	30	861	38	8%
LWD					
Sandwiches	NA	NA	629.00	31	NA
Total	2024		2025		
Total Waste per year (kg)	1037.1		774.30		-25.30%
Total Cost per year ($)	17588.23		12403.13		-29.50%

Table 5. Estimated average food waste per day in ED & SSU at Dinner

For dinner, the most wasted item was the main protein in hot meals (480g, 51%) when comparing the percentage of waste by food item, followed by dessert (1063g, 44%), main vegetables in hot meals (861g, 38%) and sandwiches (629g, 31%). The least wasted food item was the main starch in hot meals (376g, 22%). In contrast to last year's data, there was an increased proportion of waste for every food item with the most significant rise in main protein of main meals (16%). However, there was an overall reduction in cost of waste by 29.5% with a reduction in waste by 25.3%.

During the 4-day data collection period, some dinners were served with either one or two desserts by chance. A subgroup analysis was conducted to compare trays served with one dessert versus two desserts. The dessert waste percentage for trays with one dessert was 36.4%, while for trays with two desserts was 55.8%. This indicates that dessert waste was higher when two desserts were served. The waste percentage for trays with one dessert was similar to last year's data. It is proposed that the overall increase in dessert waste this year may be partly attributed to the double servings of dessert.

2.6.3 Patient preference survey

Patient preference survey (%)					
		Percentage (%)			
Breakfast		Full tray	Light option	Snacks	Nothing
2024	ED	44.7	36.5	11.7	1.17
	SSU	43.1	47.3	8.42	0
2025	ED	55.1	31	10.3	3.4
	SSU	66.6	19.4	8.3	5.6
Lunch		Hot meals	LWD	Snacks	Nothing
2024	ED	54.1	37.5	12.5	4.2
	SSU	41.1	50	2.94	0
2025	ED	57.6	36.3	6	0
	SSU	52.6	34.2	7.89	5.26
Dinner		Hot meals	LWD	Snacks	Nothing
2024	ED	32	60	0	4
	SSU	44.4	55.5	3.7	0
2025	ED	60.6	36.3	6	0
	SSU	68.4	28.94	2.63	0

Table 6. Patient preference survey

A total of 207 patients participated in the patient preference survey with 54% from SSU and 46% from ED. For breakfast time, most of the patients preferred a full tray of breakfast with a variety of items, with 67% of SSU and 55% of ED patients. After switching to LWD, most patients (53% from SSU and 58% from ED) would rather have a hot meal than lighter options like a sandwich for lunch, with only 34% and 36% of patients choosing LWD in SSU and ED respectively. For dinner, there was a higher proportion of patients selecting a hot meal (68% from SSU and 61% from ED). Overall, compared to the data from last year, more proportion of patients preferred to have hot meals instead of LWD. It can be explained by patients opting to try hot meals instead of the delivered sandwiches, influenced by cold weather during data collection period and cultural norms of hot dinners in Australia.

SUSTAINABLE HEALTHCARE AND SERVICE DELIVERY

HIGHLY COMMENDED

Hunter New England Local Health District (HNELHD), NSW

Critical Care Services, John Hunter Hospital

Risk Assess for Success Gloves off / Gown off

Aditee Parab and Nikhil Kumar

AIM

The aim is to implement an evidence-based, risk-stratified personal protective equipment (PPE) decision model, utilising existing communication pathways and frontline leadership to embed a pause-and-assess culture that is environmentally and fiscally responsible.

SUMMARY ABSTRACT

Our 36-bed mixed adult and paediatric intensive care units manages approximately 2000 high acuity admissions each year in a highly resource strained setting. In this fast-moving setting routine glove and gown use had become an unquestioned reflex that added to waste, cost, and carbon without extra protection benefit. In March 2024 the ICU nursing team, medical team, infection prevention specialists, and unit leadership identified that our unit's approach to PPE needed to be changed. The goal was to replace the reflex "routine PPE" use with evidence based, risk stratified decisions, adapting the Gloves Off/Gowns Off concepts to the realities of intensive care.

The change relied on frugal innovation. We leveraged existing communication strategies - such as morning/afternoon huddles, teams' channels, bedside risk matrix posters, modelling good behaviour and even humour. Our champions and leadership team role-modelled behaviour. We recognised the risk that Multidrug-resistant organism (MRO) transmission could increase therefore monitored MRO transmission and hospital acquired infections closely.

During the first nine months glove consumption fell by 119 580 pairs, a seven per cent reduction, and gown use fell by 107 900 units, a twenty-seven per cent reduction. These cuts removed 11.4 tonnes of clinical waste, avoided an estimated 19.3 tonnes of carbon dioxide equivalent, and saved $38,259 in procurement costs. Hand hygiene compliance rose by approximately ten per cent, and no increase was detected in MRO acquisition, central line associated bloodstream infection, or ventilator associated pneumonia compared with the 2023 baseline.

This clinician led, resource neutral project shows that targeted behaviour change can yield environmental, fiscal, and patient centred benefits in a busy critical care environment without compromising safety or speed of care. This work aligns with the New South Wales Health Future Health priority for a sustainably managed system, strengthens frontline ownership of infection prevention, and offers a practical blueprint for other ICU departments.

REPORT

APPLICATION OF ACHS PRINCIPLES

1. Consumer Focus

Routine gown and glove personal protective equipment (PPE) use can unintentionally distance clinicians from patients and families. A 2013 time-motion study showed that physicians spent nearly one third less time at the bedside when patients were managed in gloves and gowns contact isolation, with patients reporting more

concerns about their care. Further evidence indicates that patients are twice as likely to express dissatisfaction with their hospital stay when clinicians wear contact isolation PPE. In summary, the literature suggests that inappropriate or lack of evidence-based use of PPE diminishes the quality of the patient experience, underscoring the need for careful, case-by-case risk–benefit analysis.

The John Hunter Hospital ICU/PICU is a high-throughput retrieval hub that cares for more than 2000 critically ill patients each year. Many are delirious, hearing-impaired, or paediatric and rely on ungloved touch and clear facial cues for reassurance. Reducing unnecessary gowns and gloves therefore provides a tangible opportunity to improve human connection without compromising infection control.

Our change-management strategy also targeted patients and families. Posters explaining the risk-stratification matrix were displayed at each bed space, enabling consumers to see why clinicians had chosen a particular level of PPE. This helped in dispelling the false belief that routine use of gloves and gown meant less risk of MRO acquisition.

Although formal consumer-survey data were not collected within the project timeframe, the absence of negative feedback and the spontaneous positive remarks reported by clinical staff provide early qualitative assurance that the intervention aligns with public expectations for compassionate, safe care.

By increasing visibility, speeding access to the bedside, and openly explaining the risk-stratification process, the project supports the ACHS *Partnering with Consumers* and *Safe Care* principles while simultaneously advancing environmental sustainability.

2. Effective Leadership

The PPE de-implementation project grew out of the John Hunter Hospital ICU's established clinical-governance structure. The National Standard 3 Infection-Prevention Committee, a monthly forum chaired by the ICU National Standard 3 medical and nursing lead, is attended by the ICU medical quality lead, the clinical nurse consultant for infection prevention, an infectious-diseases physician, an epidemiologist, a HealthShare cleaning representative, the ICU equipment procurement representative and ICU leadership representative. This group reviews all infection-control indicators in the unit and serve as the formal sponsor, decision-maker, and escalation point for the project.

The majority of committee members are active clinicians, serving as champions and modelling expected behavior. The initiative was a shared clinical responsibility rather than an administrative directive. Because participation was voluntary and unpaid, it modelled servant leadership and underlined the project's alignment with professional values, with cost reduction a byproduct rather than the primary focus.

Years of focused culture work had already raised psychological safety on the unit. Inter-professional speaking-up workshops, daily safety huddles, and peer-review feedback had produced an environment where clinicians regardless of seniority were encouraged to speak up and question. This foundation proved critical. When the project launched, staff were easily engaged regarding their thoughts or concerns of the new PPE use matrix. The leadership group reinforced this behavior at every opportunity and linked it to the district's CORE values: Collaboration through multidisciplinary huddles, Openness by sharing audit results in plain language, Respect through non-punitive feedback, and Empowerment by authorising any team member to question unnecessary PPE use.

Leaders used a pragmatic data loop. Monthly informal hand-hygiene compliance audits, quarterly formal hand-hygiene compliance audits and infection indicators such as MRO acquisition, central-line infections, and ventilator-associated pneumonia were confirmed in the National Standard 3 meeting, then reported verbally at the next medical and nursing huddles. This low-tech but reliable method ensured a single source of truth and kept safety metrics in regular view despite having a large nursing and medical staff.

The leadership team also translated frontline insight into an immediate practice rule for the scenario most prone to reflex PPE misuse: the arrival of an acutely unstable patient after an unplanned escalation. In these high-stress resuscitations, cognitive bandwidth is scarce, and default behaviours dominate. Informally, as the project was

rolled out, rationale PPE use became more frequent rather than routine PPE use even in these high acuity scenarios.

Regular upward reporting to the Hospital Infection-Prevention Committee, ICU Quality and Safety meeting and executive team keeps executive oversight tight and accountability clear.

In summary, effective leadership in this project combined formal governance, frontline credibility, a psychologically safe culture, and a single high-impact behavioral rule that neutralized the commonest error trigger. These elements turned a volunteer effort into a sustainable practice change.

3. Continuous Improvement

The John Hunter Hospital ICU gloves off /gown off project is a highly sustainable initiative. It represents a change in clinical practice that is firmly grounded in a risk assessment-based strategy—an approach already embedded in routine ICU patient care. Therefore, once the change in practice was implemented in a transparent, modelled manner the clinicians were able to review environmental and fiscal benefits without compromise to patient care or safety. As a result, the initiative demonstrated an evidence based, collaborative approach which led to strong clinician buy-in allowing it to become a part of routine ICU care.

4. Evidence of Outcomes

The John Hunter Hospital ICU gloves off /gown off project is a highly sustainable initiative. It represents a change in clinical practice that is firmly grounded in a risk assessment-based strategy—an approach already embedded in routine ICU patient care. Therefore, once the change in practice was implemented in a transparent, modelled manner the clinicians were able to review environmental and fiscal benefits without compromise to patient care or safety. As a result, the initiative demonstrated an evidence based, collaborative approach which led to strong clinician buy-in allowing it to become a part of routine ICU care.

We also monitored informal unit supported Hand hygiene audits and quarterly QARS reportable Hand hygiene audits. We further divided the hand hygiene audits in to nursing/medical/allied health and HealthShare to further understand where to target education and outreach.

The "Gloves Off, Gown Off" initiative has delivered measurable improvements in productivity and demonstrated strong value for money by reducing inappropriate use of personal protective equipment (PPE) in the ICU and subsequently reducing the carbon footprint.

In 2023, the ICU purchased approximately 1.7 million gloves and over 400,000 gowns at a total cost of $117,567.80. As shown un tables 1 and 2 below, since the project's implementation in March 2024, glove and gown usage has dropped significantly—by 119,580 gloves and 107,900 gowns—**resulting in a direct saving of** $37,694.03.in less than one year. These reductions occurred alongside improved hand hygiene compliance and no adverse impact on infection prevention outcomes, confirming the intervention's safety and efficacy. Furthermore, this reduction equates to over **11.4 tonnes of clinical waste avoided.**

From an environmental sustainability perspective, the reduction of 119,580 gloves and 107,900 gowns is estimated to have avoided **approximately 19.3 tonnes of CO_2 emissions**, based on published life cycle analyses. This is equivalent to the annual emissions of **four to five passenger vehicles**. These savings reinforce the initiative's broader system impact—linking resource stewardship with financial, environmental, and operational sustainability.

The initiative required no new infrastructure or capital expenditure. It leveraged existing staff, audit tools, signage, and local leadership—making it low-cost, high-impact, and immediately replicable. These efficiency gains directly support HNELHD's commitment to sustainable healthcare delivery.

Table 1. Gloves and Gowns usage 01/04/2023 - 31/042024

Item	Boxes	Units per Box	Total Units	Total Cost ($)
Small gloves	3320	200	664,000	34,796.50
Medium gloves	3080	200	616,000	32,918.70
Large gloves	1573	200	314,600	16,606.20
Extra-large gloves	731	200	146,200	7,953.88
Gowns	2,129	100	212,900	25,292.52
				117,567.80

Table 2. Gloves and gowns usage 01/04/2024 – 31/03/2025

Item	Boxes	Units per Box	Total Units	Cost
Small gloves	3128	200	625600	$25982.82
Medium gloves	2986	200	597200	$24761.54
Large gloves	1401	200	280200	$11374.11
Extra-Large gloves	615	200	123000	$5281.30
Gowns	1050	100	105000	$12474
				79,873.77

This shows a cost savings of $37,694.03.

5. Striving for Best Practice

Using the RE-AIM framework - Reach, Effectiveness, Adoption, Implementation, and Maintenance - we systematically evaluated and guided the "Gloves Off Gown Off" project to optimise its impact and sustainability. Each domain supported continuous improvement and helped embed best practices throughout the intervention.

Reach focused on the extent to which all relevant staff were exposed to and engaged with the intervention. Effectiveness assessed the impact of the project on key outcomes, such as infection rates and adherence to best practices. Adoption evaluated the degree to which champions and teams embraced the initiative across different units. Implementation examined the fidelity and consistency with which the project components were delivered, supported by tailored communication methods including posters, toolbox talks, and rap songs to accommodate diverse learning styles. Finally, Maintenance addressed the long-term integration of the project into routine practice through continuous feedback, regular auditing, and ongoing review.

To demonstrate the project's impact, we conducted audits, shared infection rate data, and gathered qualitative feedback to identify barriers and highlight success stories. This multifaceted approach fostered a culture of shared responsibility, promoted engagement and reinforced the embedding of best practices

Sustaining best practices was achieved through ongoing feedback loops, regular auditing, and continuous review, ensuring the "Gloves Off Gown Off" project remains an integral part of infection prevention efforts.

INNOVATION IN PRACTICE AND PROCESS

The “Gloves Off, Gown Off” project exemplifies innovation through behaviour-led de-implementation. It addressed an entrenched, low-value practice—routine Personal Protective Equipment (PPE) use outside contact precautions—not with technology, but with critical thinking, staff empowerment, and cultural adaptation.

The project’s originality lies in recognising that the routine use of gloves and gowns for routine ICU/PICU patient assessment care are not evidence based, and the ongoing practice was an ingrained habit rather than evidence-informed policy. We implemented standard principles of change management by having a clear goal, transparent communication, engaging all clinicians early and celebrating small wins. By embedding change into existing routines—through ward huddles, bedside rounding, infection prevention discussions, and visual prompts—the team catalysed change without imposing it. Implementation was adaptive and context-specific: staff were encouraged to question PPE use aloud, with humour and curiosity welcomed, and role-modelling by senior clinicians reinforced new norms.

This approach aligns with evidence from international de-implementation literature: that successful change is more likely when staff are engaged early, education is repeated, and strategies are embedded into local culture (Verkerk et al., 2022; Dunsmore et al., 2023). The project also reflects the principles of adaptive implementation and social influence—using staff-led discussion and existing workflows to change habits and reduce harm (Braithwaite et al., 2018).

The practice change is culturally embedded. Staff now routinely reflect on PPE use and apply clinical judgement rather than habit, supported by peer modelling and visible prompts. This shift has remained stable over time and is self-sustaining through team ownership.

“Gloves Off, Gown Off” demonstrates that innovation in healthcare doesn’t always require complexity—it sometimes starts with challenging the obvious.

APPLICABILITY TO OTHER SETTINGS

The "Gloves Off, Gown Off" project in ICU was designed to enhance infection control practices by promoting the appropriate use of personal protective equipment (PPE). By encouraging staff to avoid unnecessary use of gloves and gowns when not clinically indicated, the initiative reduced cross-contamination risks and improved hand hygiene compliance. The project's simplicity and clear messaging make it highly scalable and transferable across other health services and settings. It requires minimal resources — primarily education, signage, and leadership support — allowing it to be easily adopted in different hospital wards, outpatient clinics, and even aged care facilities. Moreover, the focus on behaviour change and clinical judgment aligns with broader infection prevention strategies universally recognized across healthcare systems. Early results from ICS have demonstrated measurable improvements in infection rates, suggesting strong potential for similar outcomes in other environments. With customisation to local protocols, "Gloves Off, Gown Off" can be embedded sustainably across diverse care settings.

Our communication via posters has been widely used and adapted by other areas of the hospital and district.

Other similar initiatives include the “Gloves Off! Clean Hands, Safe for All” - John Hunter Hospital (Hunter New England Local Health District) pilot in two surgical wards at the John Hunter Hospital, launched mid 2023 showed −37 % inappropriate glove use, +24 pp hand hygiene; $/waste/$CO_2$e savings. Another example is the pilot conducted in Wyong Hospital - NSW Central Coast Emergency Department which showed Glove usage dropped by 285,000 per year (~1.3 million total) and Hand hygiene compliance rose from 80% to 85% (ABC 2025).

NSW Health Net-Zero and sustainability strategy intends to make gloves off a part of broader waste reduction strategy in NSW. Our “Gloves off, Gown off” risk assessment-based strategy can easily be applied to other ICUs in the state as well as nationally.

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SUSTAINABLE HEALTHCARE AND SERVICE DELIVERY

TABLE OF SUBMISSIONS

Barossa Hills Flerieu Local Health Network, SA

Kangaroo Island Health Service first in 2025 to go all electric and gas free

Daniel Panic

East Grampians Health Service, VIC

The Just Cos Initiative: an integrated quality improvement and research approach

Jaclyn Bishop

Eastern Health, VIC

Improving food service safety and food waste in Emergency and Short Stay Departments

Warwick Millard

Gold Coast Hospital and Health Service, QLD

Product Squads - The Digital Cure for Healthcare Bottlenecks

Kirsten Hinze, Waru Paku, Emma Mockler, Juan Zhao, and Paige Paton

Hunter New England Local Health District, NSW

Risk Assess for Success Gloves off / Gown Off

Aditee Parab and Nikhil Kumar

Hunter New England Local Health District, NSW

Rural Allied Health: Growing Future Professionals

Louise Maye, Katrina Wakely, and Patricia Webb

Liverpool Hospital, NSW

Aprons No More

Dr Shilpa Dsa, Mariepaz Hazell, Renee Kojic, Sharon Ann Shunker, Prof Satyadeepak Bhonagiri, and Michelle Dowd

Liverpool Hospital, NSW

Home based SCIg Program for Haematology

Minh Hua, Karl Jobburn, Jinky De La Paz, Samanatha Kurniawan, and Gamshagi Karunaivel

Liverpool Hospital, NSW

Pathology Stewardship in the Intensive Care Unit

Dr Shilpa Dsa, Dr Kanaka Sundaram Rachakonda, Prof Satyadeepak Bhonagiri, Dr Ramanathan Lakshmanan, Dr Michael Maley, Gianluca Parisi, Mariepaz Hazell, Jennifer McClure, and Joseph Descaller

National Critical Care and Trauma Response Centre, NT

Strengthening Laboratory Capability for Emergency Health Response: Quality Improvements within the National Critical Care and Trauma Response Centre (NCCTRC) / Australian Medical Assistance Team (AUSMAT) Laboratory

Leanne Jones

Northern Territory Health, NT

Multidose Contrast Injector

Katrina Edwards

Riverland Mallee Coorong Local Health Network, SA

Riverland Academy Clinical Excellence (RACE) Leadership Program

Prof Paul Worley and Kerry Dix

Royal North Shore Hospital, NSW

INSPIRE-RT - A mobile application to improve training and access to radiation therapy breath hold techniques

Toby Lowe, Rory Hartley, A/Prof Susan Carroll, and A/Prof Gillian Lamoury

South Metropolitan Health Service, WA

Complex Care Coordination Team (CoNeCT) data modelling and analysis dashboard

Tracey Ticehurst, Emma Crossing, and Samantha Rankin

South Western Sydney Local Health District, NSW

Fostering a Sustainable Healthcare Workforce: Listening to Our People

Prof Josephine Chow, Jason Lawrence, Courtney Troughton, Cathy Ding, and Rodney Tejares

Sydney Adventist Hospital, NSW

Caring Beyond Surgery: A Quality Improvement Journey for Enhanced Recovery

Jodie Privett and William Downey

View Health Pty Ltd, WA

Healthy Patients, Healthy Savings, Healthy Environment Initiative

Lorna Cook

Western Health, VIC

Designing an Allied Health Grade Two Workforce Development Program

Gracie Tomolo, Brodie McCormack, and Rebecca Tivendale

Western Health, VIC

Lived Experience Leading Change: Embedding Disability Advocacy in Healthcare

Rebecca Barbara and Alex Potter

Western Health, VIC

Implementation of reusable linen in the intensive care unit: Sustainability, safety, and environmental outcomes

Kylie Feely, Stacey Matthews, A/Prof Forbes McGain, Mariana Ibarra, Michelle Pinan, Catherine O'Shea, Dr Scott McAlister, Edward Quilas, and Prof Rochelle Wynne

HEALTHCARE MEASUREMENT

WINNER

Hunter New England Local Health District (HNELHD), NSW

Population Health

Healthy Beginnings for HNE Kids: from pilot to HNE-wide scale-up

A/Prof Rachel Sutherland, Prof Luke Wolfenden, Nayerra Hudson, Dr Alison Brown, Dr Jacklyn Jackson, Jessica Pinfold, Christophe Lecathelinais, Dr Paul Craven, Sinead Redman, Susan Darby, Tauri Smart, and Fiona Murphy

AIM

Despite robust systematic review evidence demonstrating the efficacy of digital health interventions targeting parents in improving child health behaviours, no digital health interventions were embedded into routine health service delivery across the first 2000 days (0-5 years) in Australia or globally to optimise child and parent health outcomes.

We aimed to revolutionise the delivery of healthcare to families during the first 2000 days (birth-5 years) by leveraging existing health services and systems to universally deliver an evidence-based age-and-stage aligned digital model of care (text-messaging program) called Healthy Beginnings for Hunter New England Kids (HB4HNEKids).

The HB4HNEKids program seeks to be an exemplar for conducting continuous quality improvement in the digital health space, embedding a learning health system approach to continuously optimise the HB4HNE Kids program to meet the needs of: 1) parents (consumers); 2) the health system and 3) improve the health outcomes of young Australian families during this foundational life stage.

SUMMARY ABSTRACT

The first 2000 days of life—spanning from conception to age 5 years—is a critical period for establishing lifelong health behaviours impacting immediate health and future chronic disease risk. Despite robust systematic review evidence supporting the efficacy of digital health interventions targeting parents during this window, no such programs had been embedded into routine health service delivery in Australia. Healthy Beginnings for Hunter New England Kids (HB4HNEKids) was developed to address this implementation gap by embedding an evidence-based, age- and stage-aligned digital model of care into routine Child and Family Health Services (CFHS).

HB4HNEKids is a universal text-messaging program co-developed using behavioural theory, delivering timely, preventive health information directly to parents' mobile phones from birth to five years. Designed to complement existing face-to face CFHS care, the program aims to increase engagement, improve parental health literacy, and establish foundational health behaviours in children. Development of the program involved extensive co-design with over 40 stakeholders including parents, clinicians, Aboriginal and multicultural health workers, policy partners, implementation scientists and policy partner. Content was aligned with state and national priorities, including the First 2000 Days Framework and the NSW Healthy Eating and Active Living Strategy.

The program was piloted in five diverse CFHS sites—including two Aboriginal services—over a three-year period, using a Learning Health System framework to integrate continuous evaluation into service delivery.

HB4HNEKids achieved high uptake (73% of eligible families), retention (85%), and acceptability (>90%). Parents reported high levels of engagement, with 76-83% reading most or all messages. The pilot evaluation identified

statistically significant improvements in child vegetable intake (+0.23 serves/day, p=0.006), and parental mental wellbeing (p<0.001) at 12 months, compared to usual care. Participants also reported breastfeeding rates 5 percentage points higher than non-participants at both 6 and 12 months, but this was not statistically significant. The program's low drop-out rate (6.9%) and strong engagement across priority populations—including Aboriginal (98% uptake) and CALD families (100% uptake)—underscore its equity and relevance. Embedded research trials within the Learning Health System model have been used to test and optimise key delivery components, including the optimal message "dose" and the efficiency of clinician-initiated vs system-initiated enrolment models. Findings led to the adoption of a lower-cost, lower-volume messaging schedule that maintained engagement while reducing attrition and costs (low dose: $9.32/participant vs high dose: $12.96).

Building on pilot success, HB4HNEKids was scaled up district-wide in July 2024 and is now delivered to over 10,000 families annually across 49 CFHS sites. Scale-up was supported by streamlined integration into existing service workflows and the use of electronic medical record infrastructure to automate enrolment. A world-first trial is currently evaluating the effectiveness, equity, and efficiency of this system-initiated onboarding model, aiming to minimise clinician burden while maintaining high program reach and quality.

The program's commitment to continuous improvement is embedded in its governance and design. Regular data reviews are conducted with clinicians, researchers, and consumers to refine program content, timing, and delivery. Innovations such as weblink click tracking, real-time opt-out analysis, and targeted qualitative feedback loops have ensured that HB4HNEKids remains responsive to the needs and preferences of families. Trials are underway to optimise modules on breastfeeding and postnatal mental health, and scoping work is being conducted to adapt the program for rural and remote communities.

HB4HNEKids represents a model of best practice in preventive child health, combining policy alignment, evidence-based and theoretical intervention design, and ongoing continuous embedded measurement strategies. It addresses a critical service gap, offering scalable, cost-effective, and equitable digital support to families during the most formative stage of life. Its infrastructure-light design, high consumer acceptability, and integration within routine care make it readily transferable to other Local Health Districts in NSW and, to other jurisdictions both nationally and internationally.

As NSW Health progresses toward the implementation of the Single Digital Patient Record, opportunities are being explored to integrate HB4HNEKids into the Digital Blue Book, enhancing automation and reach. Internationally, the model provides a compelling example of how digital health, when underpinned by continuous measurement and strong governance, can be used to transform health service delivery, improve population outcomes, and support families equitably during the early years of life. HB4HNEKids is an exemplar of innovation in preventive health, demonstrating how digital models embedded into existing services—guided by data, co-design, and systems thinking—can improve health at scale. It offers a transformative approach for addressing chronic disease risk early in life and serves as a replicable model for health systems seeking to implement sustainable, consumer-centred digital care.

REPORT

APPLICATION OF ACHS PRINCIPLES

1. Consumer Focus

The challenge:
Across Hunter New England Local Health District, >50,000 children are within their first 2000 days of life -a critical stage to optimise health and development outcomes, which if established early, saves $15.2 billion annually in preventable health and tertiary care (Crosland et al, 2019). This critical window supports parents/carers in establishing preventive health behaviours in children that could avoid up to 80% of future chronic disease (Astell-Burt, 2018). For example, longer breastfeeding duration is associated with a 26% reduction in risk of overweight/obesity in childhood and adulthood, and a 35% reduction in Type II diabetes. (Victoria, 2016; Mamun, 2025) Concerningly, child health has declined in the past decade and indicators of poor health are evident. (AIHW, 2018) Just 1% of infants are exclusively breastfed to six months, (Netting, 2022) by 3 years 21% of children are above a healthy weight range, (AIHW, 2023) and by age 4 only 2% of children meet the recommended serves of vegetables. (ABS, 2024)

In New South Wales (NSW) and similarly across Australia, Child & Family Health Service (CFHS) provide routine face-to-face universal care across the first 2000 days. However, 2023/2024 data from the Hunter New England Local Health District (HNELHD) of NSW indicates that whilst 83% of families accept the initial 1-4-week health checks offered by CFHS, engagement steadily declines to less than 15% by 12 months, down to just 5.3% by 4 years (Appendix 1).

Understanding consumer needs to develop an innovative solution:
Surveys conducted with mothers (n=365) within the HNELHD indicated that most (82-92%) were agreeable to receiving preventative health care from CFHS via technology (i.e. email, telephone or text-message), and almost all (97%) were agreeable to receiving care on a variety of health topics (e.g. Growth checks and immunisation reminders; introduction to solids and breastfeeding) (Delaney et al., 2024). In addition, over 90% of Australian adults own a mobile phone (Baffour et al., 2016), indicating that evidence-based information delivered direct to parent mobile phones present a significant opportunity to supplement usual face-to-face CFHS care across the first 2000 days, to enable population level reach and impact.

Healthy Beginning for Hunter New England Kids (HB4HNEKids) is an innovative text messaging model of care designed to be delivered universally to families alongside routine CFHS during the first 2000 days. The program was developed as part of an iterative process (Appendix 2), including: i) a review of current policies and guidelines aligned with the First 2000 Days; ii) a literature review to identify existing evidence-based interventions; iii) continuous consultation and co-design with key stakeholders and consumers (i.e. health executive, managers, nursing staff, allied health, health promotion staff and parents of young children); iv) piloting, optimising and scaling up. The co-design process identified the priority health behaviours to be incorporated into the digital model of care (including infant feeding (e.g. breastfeeding), introduction to first and family foods; child health and development; physical activity and sedentary time; carer wellbeing; sleep and primary health care checks and immunisation) as well as key barriers and enablers associated with establishing the priority health behaviours (including knowledge of guidelines; access to services; overcoming feeding challenges and conflicting advice) (Brown et al., 2025).

Piloting a digital model of care across the First 2000 Days to strengthen routine delivery of preventive health care:
Following the co-design process, a pilot feasibility trial of the HB4HNEKids mHealth program was conducted within 5 diverse CFHS (Greater Newcastle, Cessnock/Kurri and Armidale, including two Aboriginal services, n=5800 families) whereby CFHS clinicians would offer the digital service to families when booking in a 1-4-week child health check appointment. Over the 3-year pilot phase, this model of offering HB4HNEkids was shown to be feasible to deliver alongside usual CFHS care, connecting 96% of families who were offered the program (i.e. 4% of families opted not to receive HB4HNEKids), and only 6.9% families opting out once commencing the program. The population level reach of HB4HNE Kids when embedded into routine care improved the provision of evidence based preventive health care to families, ensuring consistent care was provided universally at the population level. The pilot phase was evaluated via two cross sectional telephone (or online) surveys with families receiving the HB4HNE Kids program and those not receiving the program at 6 and 12 months. Program evaluation identified the digital model of care was highly feasible to deliver, highly acceptable to parents and CFHS clinicians (>90% reported the program to be acceptable), achieved high engagement (76-83%) and impacted positively on child and parent health behaviours. HB4HNEKids was effective at improving key health behaviours including child vegetable and fruit intake and parental wellbeing (Jackson et al., 2025). As part of usual service delivery, parents were also invited to provide qualitative feedback about the program (Appendix 3), which only served to strengthen the acceptability outcomes measured as part of program evaluation. The pilot evaluation also found that clinician time accounted for >50% of the cost to deliver the HB4HNEKids intervention, indicating the potential to reduce service delivery costs via exploring alternate models of parent uptake.

Scaling up HB4HNE Kids district wide to expand reach and impact:
Based on the results achieved in the pilot trial, HB4HNEKids is now routinely delivered to all new parents (>13,000 new families/year) across Hunter New England Local Health District via 49 CFHS clinics in the region, complimenting and enhancing the reach and impact of existing face-to-face services which significantly declines overtime. To enhance population level impact and sustainability of HB4HNEKids we are currently evaluating

effective models of scaling up the program via the use of existing health system infrastructure (electronic medical records) to automatically connect families with the program (Hudson et al., 2025). The use of existing health service infrastructure to automate preventative health care, provided an efficient, effective and cost-effective model of enhancing child health outcomes, ensures population level reach and universal delivery of evidence based care, while also addressing staff capacity and retention challenges within the health system - concerns recently the subject of an NSW Parliamentary inquiry.

A learning health system approach to continuously improve the acceptability and impact of HB4HNE Kids: Learning health systems are an innovative approach for embedding evaluation into routine care. They are learning systems which generate evidence within and for services that are directly involved in routinely providing the service. Learning Health Systems bring together researchers, clinicians and consumers to review evidence, co-develop services, implement the service as part of routine care, collect and review health systems and patient data and optimise services to improve the effectiveness and efficiency of care. HB4HNEKids has established a learning health system structure, where Clinicians, researchers and consumers review data (acceptability, engagement and behavioural) that is continuously collected from parents (consumers) to inform service optimisation, adaptation and service enhancements. This Learning Health System model has been used to inform program content, impact, service dose and enhance efficiency (cost and sustainability). As a result of HB4HNEKids, delivery of preventive health care across the first 2000 days has been transformed, serving as a model for embedding digital care into routine practice across the health system to achieve population wide service delivery and end-user health gains.

2. Effective Leadership

HB4HNEKids was developed to address families declining engagement with face-to-face care over the first 2000 days, increasing reach and routine parental engagement and offering the opportunity to revolutionise the delivery of universal preventative health care across the first 2000 days at a population level. HB4HNEKids is the only digital care model internationally, to be embedded into routine service delivery to support the first 2000-day period to be universally delivered to all families. Over 4-years, HB4HNEKids, has been co-designed, piloted and scaled-up by Population Health and Child and Family Health (CFH), using an innovative learning health system to continuously optimise the effectiveness of the program - keeping children and families healthy by delivering digital support direct to parent's mobile phones.

The innovative care model and a key aspect of the program's success was to establish effective leadership and engage staff in decision making processes, across all phases of the program (program development, pilot and scale-up) under the guidance of a cultural governance structure.

Effective leadership is demonstrated at all levels:

1) Program governance: this innovative model of care (text-message program embedded with CFH care) was established under the guidance of a governance structure that ensured cultural governance and included both Population Health and Children, Young People and Family Directors and Senior Management, Aboriginal partners and was guided by NSW Health Policy partners (eHealth, Health and Social Policy Branch). This overarching Governance structure ensures executive leadership and support sustainability.

2) Program co-design: The program has been co-designed from conception through to scale up: Each project phase was developed using co-design principles, with practice experts from Child and Family Health, Allied Health, Population Health, Aboriginal and Multicultural Health, implementation scientists, statistical and data-scientists and parents/end-users.

3) Learning Health System approach to continuously optimise the impact: Our innovative learning health system demonstrates commitment from the health district to work in partnership with clinicians, consumers and policy agencies to make continuous improvements to optimise health outcomes for consumers. The learning system is led by our project team which consists of an innovative research-practice partnership, where researchers (from the National Centre of Implementation Science, University of Newcastle, NSW) are embedded in the health service (Population Health) with clinicians to optimise care delivery and health outcomes.

Despite the 3-year pilot trial for HB4HNEKids demonstrating feasibility of the program to be delivered at scale (reaching 6243 families from 5 CFHS), a need to optimise the model of offering the program (i.e. onboarding families to the program) was identified to support universal coverage/reach of the program in HNELHD. As part of a world-first trial, our team is evaluating the impact of two scale-up models for the HB4HNEKids program to HNE families (a clinician-initiated model vs an automated systems-initiated model). The models and associated implementation strategies for scaling-up HB4HNEKids were co-designed with clinicians to ensure the program aligns with existing workflows, and designed to minimise clinician time pressures, while facilitating ongoing family engagement with age-and-stage aligned care. As a result of the co-design process for HB4HNEKids scale-up, CFH nurses reported the program is appropriate (95%), acceptable (93%) and algins with clinical values (93%). Since the launch of HB4HNEKids district wide scale-up in July 2024 the program is reaching >13,000 families in HNE.

3. Continuous Improvement

Establishing Learning Health System Infrastructure to ensure continuous improvement:
The HB4HNEKids program continuously focuses on providing quality evidence-based care to families in the community across the first 5 years of a child's life. To facilitate effective implementation and rollout of the program, while leveraging existing healthcare services and systems, this program of work has continuously engaged various stakeholders (Executive endorsement, child health, health behaviour and implementation science researchers, CFH clinicians, dietitians, multicultural and Aboriginal Health and parents) as part of a rigours co-design process. Using a Learning Health System, the team undertakes embedded research trials within routine care delivery, to promote program quality improvement, address key evidence-practice gaps or support the optimisation of the program content.

Continuous improvement is a cornerstone of the HB4HNEKids program, whereby the team has developed a Learning Health Systems process for testing and evaluating key program innovations, including i) Optimised breastfeeding support content to further impact breastfeeding outcomes at 6 months (trial in progress); ii) A parental mental wellbeing support module to further improve postnatal mental wellbeing (trial to commence in September 2025), and iii) Testing the best (most impactful, equitable and efficient) model for scaling-up the HB4HNEKids program (trial in progress). Scoping is also underway to assess potential adaptations for priority populations, including Aboriginal families and those living in regional, rural and remote communities. The findings from these trials will be swiftly and efficiently implemented/adopted within the program, offering a unique opportunity to continuously optimise healthcare delivery during the first 2000 days.

Embedded research as part of routine service delivery
For example, our team found there was minimal evidence to inform the optimal frequency/quantity of text-messages to send families enrolled in our program. Therefore, to identify the optimal dose of the text-messages, participants enrolled in HB4HNEKids were randomised into either a high dose (average 111-121 text messages) or low dose (average 80-82 messages) text message group for the first 2 years of the program. While this embedded research trial did not detect a statistically significant effect of the message dose on participant engagement (i.e. link click rates) or health outcomes (e.g. breastfeeding rates), the high dose group had a significantly higher rates of participant opt-outs (high dose 6.8% vs low dose 3.9%, $p<0.001$) and cost (low dose $9.32/participant vs high dose $12.96/participant). Given dose was found to have minimal impact on program engagement and breastfeeding rates, the lower dose had a lower opt-out rate and lower cost, therefore HB4HNEKids has since adopted the low dose message schedule program wide (manuscript under review/in-press).

The HB4HNEKids project team has also tracked the 'click rates' of weblinks embedded within the text-messages as a proxy measure of engagement with the text-message content, which has supported continuous refinement of text-message content/topics and delivery (i.e. time of day messages are sent) to ensure messages are optimally engaging and of relevance/interest to parents.

HB4HNEKids is transforming the delivery of preventative health care during the first 2000 days, serving as a model for embedding digital care into routine practice across the health system to achieve population wide service delivery and end-user health gains. Further, HB4HNEKids is now exploring opportunities to integrate the innovative program into the Digital Blue Book as part of the state-wide implementation of the Single Digital Patient Record.

4. Evidence of Outcomes

Despite robust systematic review evidence demonstrating digital health intervention that target parents can improve child health behaviours, there were no routine delivery of digital health intervention across the first 2000 days embedded into routine care in Australia or internationally.

To translate research into practice, and ensure effective intervention reached and impacted on the community they were intended for, the HB4HNEKids pilot feasibility intervention was conducted in 5 diverse CFHS (Greater Newcastle, Cessnock/Kurri and Armidale, including two Aboriginal services), over 3-years demonstrating HB4HNEKids:

1. Is feasible to deliver via CFHS, engaging 73% (N=6243) of all eligible families during the pilot period.
2. Has high program reach, with more than 85% (N=5661) remaining enrolled in the program.
3. Is acceptable to parents, evidenced by over 90% of parents reporting that they like the program and would recommend the program to other parents. Most parents (≥97%) were happy with the timing of the delivery of the text messages based on their child's age and development.
4. Is engaging to parents, evidenced by 76-83% of parents reporting that they 'always' or 'very often' read the text-messages, spending on average 5-7 minutes engaged in the program content.
5. Has a low drop-out rate, evidenced by just 6.89% of families opting-out of the program.
6. Has equitable reach and engagement with priority populations, evidenced by high enrolment of both Aboriginal (98% of those offered) and Cultural and Linguistically Diverse (CALD) (100% of those offered) families, and low opt-out rates of Aboriginal (3%) and CALD (0%) families.
7. Has engaged with over 65% of eligible families (report reading all or most messages).
8. Improves child diet: evidenced by statistically significant increases in child vegetable intake at 12 months (+0.23 serves/day, p=0.006) for HB4HNEKids participants compared with usual care.
9. Improves parental mental wellbeing: evidenced by significantly higher parental mental wellbeing scores at 12 months ($p<0.001$) for HB4HNEKids participants, compared with usual care.
10. Highly amendable for scale-up, following a formal scalability assessment of the pilot program using the Intervention Scalability Assessment Tool (ISAT) (Milat et al., 2016).
11. Scale up using routine health system infrastructure (electronic medical records) to automate the commencement of the program and achieve population level reach indicates 94.1% of families receive HB4HNE Kids with just 3.1% opting out.

5. Striving for Best Practice

The HB4HNEKids program pilot was developed as part of an extensive co-design and theory informed process to ensure the program was:

4. Policy aligned: developed to align with key policy documents including the First 2000 Days Framework, the NSW Healthy Eating and Active Living (HEAL) Strategy 2022-2032 and The National Digital Health Strategy 2023-2028.
5. Evidence based: informed by a meta-review of 25 systematic reviews demonstrating parent-targeted mHealth intervention improve health literacy, antenatal service utilisation, child vaccination rates, preventive health behaviours and maternal health outcomes (Hall et al., 2015). An RCT conducted by Sydney Local Health District (Healthy Beginnings), demonstrating that 12-month parent targeted text-message intervention improved infant health behaviours (screen time (OR, 1.28, $p\leq0.05$) and no bottle at bedtime (OR, $1.29\leq0.05$), compared with usual care (Wen et al., 2020).
6. Theory informed: designed using Health Behaviour Theory, Frameworks and evidence informed policies including:
    - The Behaviour Change Wheel, the Theoretical Domains Framework and Behaviour Change Techniques

- Use of the NSW Health Consumer Resource Development policy and Sydney Health Literacy tool
- The NSW Aboriginal Health plan and ongoing cultural advice sought through governance structures/partners

7. Health Service aligned: The program was developed to be delivered to families attending CFHS and compliments the existing healthcare provided by CFHS.
8. Meeting consumer needs: The program was co-designed in close collaboration with CFH and allied health staff, multicultural and Aboriginal health partners, representatives of the LGBTQ+ community and parents of young children.

Following the promising findings of the HB4HNEKids pilot, the scale-up models and associated implementation strategies were informed by best practice processes including:

- Identifying barriers to implementing digital health through literature, and service consultations.
- Mapping identified barriers to the Behaviour Change Wheel, Theoretical Domains Framework and relevant Behaviour Change Techniques.
- Defining strategies according to the Expert Recommendations for Implementing Change (ERIC).
- Outlining the objectives of each strategy using the Action, Actor, Context, Target, Time (AACCT) framework.

Furthermore, by embedding a learning health system structure, the program has developed pathways to seek ongoing consumer/community feedback and input that will be used to refine and optimise the program. Learning health systems are recommended to support best digital health, data-driven practice and improve patient outcomes (Centre for Digital Transformation of Health, 2024).

INNOVATION IN PRACTICE AND PROCESS

The provision of universal healthcare during the first 2000 days is outlined in both state and national policies, with care usually being delivered by a range of health care providers, including CFHS, and traditionally utilises face-to-face models. Whilst research demonstrates that receival of care at scheduled timepoints across the first 2000 days is associated with reduced risk of hospitalisation, emergency visits and early identification of health and developmental concerns (Crosland, 2029), this care can be fragmented and poorly attended, due to barriers experienced by parents, including time, travel and scheduling conflicts (Love, 2018, Dept Premiers and Cabinet, 2017).

Meta-reviews identified digital health interventions as an opportunity to deliver preventative health care, and utilised text messaging to improve preventative health behaviours in the early years, resulting in significant improvements in BMI, breastfeeding and small screen recreation (SSR), as well as nutrition and infant feeding practices (Ekambareshwar et al., 2021). 2021). However, limitations in the scalability of these programs have hindered the implementation of these outcomes in real world settings.

Despite the research evidence, there were no mHealth interventions addressing the first 2000 days embedded into routine care, representing a significant research to practice gap and a lost opportunity for health systems to efficiently optimise child health. HB4HNEkids program is the first digital health program that delivers a universal model of care embedded into existing routine child and family health care, that is offered to all families during the first 2000 days of life with population level reach. This was achieved through an extensive co-design process that aimed to identify gaps in current service provision, address clinician barriers to offering the program as part of routine care, simplifying onboarding processes, and ensure project deliverables aligned with local priorities, as identified by a broad range of partners.

Furthermore, the program model of providing asynchronous care delivered directly to a parent/carer's mobile phone, ensured that regular evidence-based age and stage relevant information about key health behaviours, could be accessed at a time and place convenient to the end-user.

Utilising a Learning Health System (LHS) framework (Wolfenden, 2024) the program engaged with a range of multidisciplinary partners who supported program governance and co-design, conducted regular policy and evidence reviews and ensured that systems were in place to embed data collection and management into usual program delivery/practices. This LHS approach served to tailor program elements, effectively evaluate service, embed research activities, including optimisation and implementation trails and rapidly inform quality improvement activities.

As part of district-wide scale-up, HB4HNEKIds is again, innovating processes by utilising existing health system infrastructure (electronic medical records) to automatically connect families with the program (Hudson et al., 2025), seeking to minimise clinician burden, whilst improving the efficiency, effective and cost-effectives of delivering preventative health care.

APPLICABILITY TO OTHER SETTINGS

As the HB4HNEKids program was specifically designed to be delivered alongside routine healthcare offered by Child and Family Health (CFH) services and utilises existing service processes and infrastructure (e.g. health service data), the model is readily transferable to CFHS across New South Wales (NSW). The integration of HB4HNEKids into standard care pathways demonstrates its compatibility with current clinical workflows and capacity to enhance service delivery without imposing additional burden on staff.

Our early evaluation has demonstrated strong uptake and retention among families from culturally and linguistically diverse (CALD) and Aboriginal backgrounds. These findings, combined with the co-design process that engaged representatives from Aboriginal, multicultural, and LGBTQ+ communities, suggest the model has strong cultural adaptability and responsiveness. The program team is actively conducting qualitative research in regional, rural, and remote communities to identify any necessary adaptations, ensuring the model is both scalable and equitable across diverse geographies and population groups.

Importantly, the program's core infrastructure—a text-message platform linked to child age and development—is both low-cost and highly adaptable. This allows for tailoring of health content to different population needs, service contexts, or health system priorities. The asynchronous nature of the intervention allows families to receive support at a time and place convenient to them, reducing common barriers to engagement such as transport, time, or scheduling conflicts.

The program's scalability is further supported by current health system reforms. With NSW Health progressing toward implementation of a Single Digital Patient Record (SDPR), there is a timely opportunity to embed HB4HNEKids content directly into the Digital Blue Book, enabling automated onboarding and reducing the reliance on clinician-initiated enrolment. This offers a pathway for seamless integration of HB4HNEKids across the state and potentially nationally, facilitating consistent delivery of preventive health messages to all families.

Beyond NSW, the program's design principles—evidence-based content, digital delivery, co-design, and embedded continuous evaluation—are aligned with international best practices in preventive health and digital innovation. Universal child health services are a core component of health systems globally, and many countries face similar challenges in maintaining engagement with families across the early years. As such, the HB4HNEKids model may be readily adapted and implemented in other jurisdictions with similar service structures or population needs- all Australian jurisdictions.

Moreover, the program's use of a Learning Health System approach—embedding research, implementation, and feedback mechanisms into routine care—provides a replicable framework for other digital health initiatives seeking to embed continuous quality improvement within service delivery. By generating real-time data on program engagement, acceptability, and health outcomes, the model demonstrates how measurement can be used to drive iterative improvements and inform scale-up decisions.

In summary, HB4HNEKids offers a scalable, adaptable, and equitable approach to delivering preventive care during the first 2000 days. Its applicability across a range of settings, populations, and systems positions it as a leading example of digital innovation in early childhood health.

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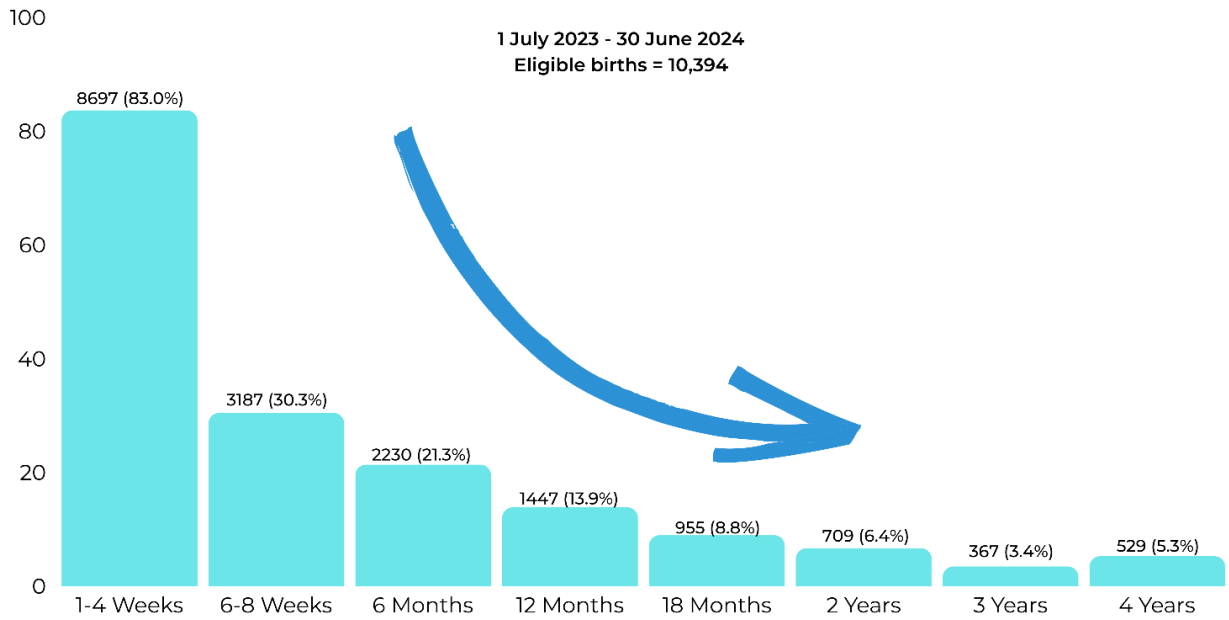
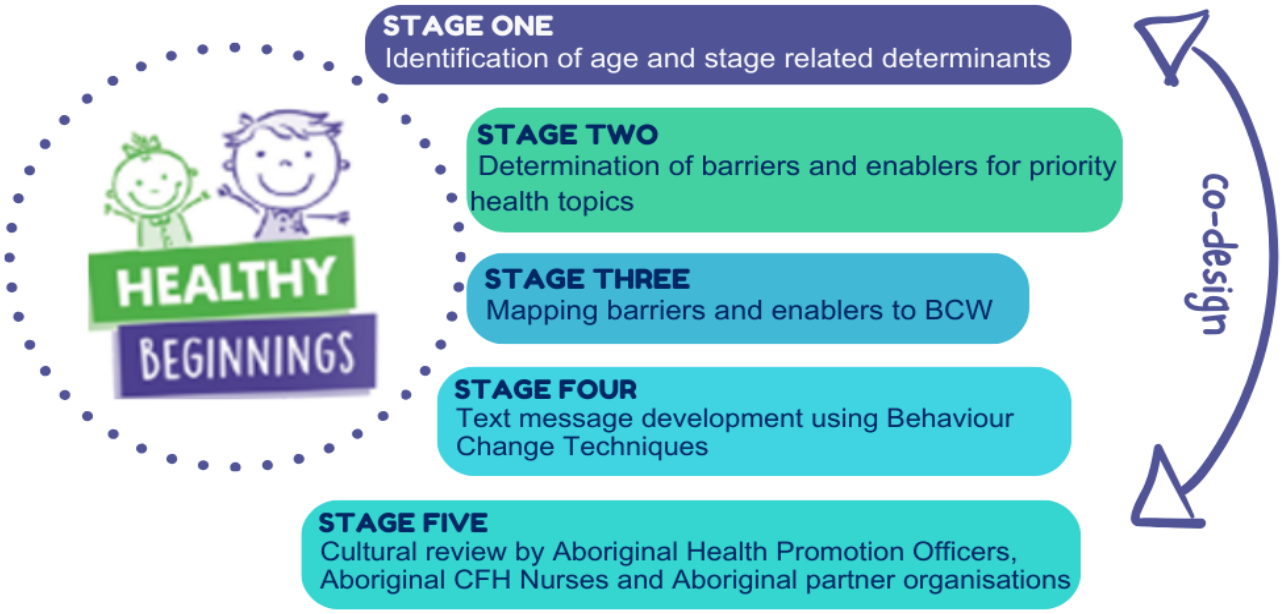
APPENDIX

Appendix 1: Personal Health Record Checks: Hunter New England Local Health District



Appendix 2: Iterative co-design process of Healthy beginnings for HNE Kids



Appendix 3: Parent testimonials

- Love the service as it provides perfectly timed, great advice and reassuring information without being overwhelming for fresh parents.
- Very helpful as I'm a first-time mum and the whole experience is new to me. I love the support and information given. I've recommended it to friends with babies. It's very helpful and I'm very pleased with the service
- Timing has always been spot on with messages, like you guys have been reading my mind! Always appreciative of the messages received and the corresponding information links
- I've really liked getting the text messages. This is baby number 3 but even just the encouraging little messages have been lovely. Raising babies is hard. Highly recommend.
- Absolutely amazing and so grateful! Thank you!!
- Very helpful thank you. Every parent needs this!
- I love the messages and how the program keeps up with my baby it is very helpful and the links have been a lifesaver

HEALTHCARE MEASUREMENT

HIGHLY COMMENDED

Eastern Health, VIC

-

Blood Component Data and Informatics

Petra Spiteri

AIM

This project aimed to implement a Power BI Dashboard for the Usage and Wastage of Blood Components at Eastern Health.

There were three predominant objectives:

1. To present monthly Blood Product Usage and Wastage data using a modern technology-driven platform for data measurements called Power BI Reporting.
2. To illustrate and benchmark blood component wastage data at organisational, state and national levels.
3. To provide key stakeholders from any location across Eastern Health with 24/7 access to the Power BI dashboard for Usage and Wastage.

SUMMARY ABSTRACT

In Australia, blood transfusions are a common medical procedure, with approximately one in three people needing blood or blood products in their lifetime. Blood and blood products are crucial for saving lives. Demand and supply of blood and blood products requires a balance between the supply and demand.

Key statistics about blood transfusions and blood donation in Australia and at Eastern Health include:

- Australia requires over 29,000 blood donations from voluntary donors per week to meet demand.
- A single blood donation can save up to three lives, however only approximately 3% of Australians donate blood annually.
- Blood cancer patients are the largest recipients of blood transfusions, with over a third of whole blood donations going to support their treatment.
- Eastern health staff and the community contribute to this number of donations by promoting staff and the community joining the Eastern Health Blood Donation Team.
- The Eastern Health Blood Donation team has saved up to 1014 lives to date in 2025. (Lifeblood Teams Result on 6/8/2025)

Blood and blood products are managed to minimise wastage and ensure that products are available to meet clinical demand in times of blood supply shortage. Organisations need to ensure blood product use is optimised and wastage is minimised by conducting monthly blood usage and wastage audits and reviews. Communicating the outcomes of blood usage and wastage in partnership with members of the healthcare sector increases awareness of using this precious resource only if required and minimises waste. This ensures when there is a high demand for its use there is enough supply to meet the needs of our most vulnerable in the community we serve.

The Australian Commission on Safety and Quality in Healthcare for Standard 7: Blood Management states "Leaders of a health service organisation describe, implement and monitor systems to ensure the safe, appropriate, efficient and effective care of patients' own blood, as well as other blood and blood products. The workforce uses the blood product safety systems."

National Safety and Quality Healthcare Standards for Standard 7: Blood Management (NSQHS) includes the following actions:

- Action 7.02 Monitoring performance and reporting outcomes of blood management.
- Action 7.09 Trace blood and blood products from entry, to transfusion, discard, or transfer.
- Action 7.10 Manage availability of blood and eliminate avoidable wastage.

This includes Action 7.10 Manage availability of blood and eliminate avoidable wastage also includes a statement in relation to the health service organisation has processes to:

a. Manage the availability of blood and blood products to meet clinical need
b. Eliminate avoidable wastage
c. Respond in times of shortage

The National Blood Authority (NBA) manage and coordinate arrangements for the supply of blood, blood products and blood services in Australia. Under the national blood arrangements, NBA's role is to deliver an uninterrupted supply of blood and blood products to Australians in need. The NBA:

- secures the supply of blood and blood products
- improves risk management and blood sector performance
- promotes the safe and efficient use of blood and blood products.

The NBA collaborates with suppliers and stakeholders across the blood sector. As a statutory agency, they represent the interests of the Australian, state and territory governments. For 20 years, the NBA have delivered an uninterrupted supply of blood, blood products, and blood services to Australians in need under the national blood arrangements. Eastern Health is one of the stakeholders in the blood sector. There are blood product wastage benchmarks set by the National Blood Authority. BloodNet reports include the target rates that have been established for: red cells (wastage target 2%), platelets (wastage target 17%), fresh frozen plasma (FFP) (wastage target 10%) and cryoprecipitate (exempt). Eastern Health includes these targets in the Usage and Wastage Power BI Report which has been developed for blood wastage.

Today, a booming and fast changing IT platform supports auditing processes to transition from the original manual transfusion audit methods to a new ere that is innovative, practical, and exciting. The project used the redesign methodology from Safer Care Victoria, Plan, Do Study Act (PDSA), a structured review of how usage and wastage audit data is collected and presented for blood management. The aim was to:

1. present the monthly blood product usage and wastage data using new IT based functionality (Power BI).
2. present data at an organisational level, and benchmark against state and national levels.
3. provide stakeholders from any location with 24/7 access to the Usage and Wastage Power BI dashboard.

At Eastern Health, the Blood Management Clinical Risk Governance Committee (BMCRGC) focuses on ensuring the safe and appropriate use of blood across Eastern Health. Data is monitored and extracted for blood usage and wastage monthly from the National Blood Authority: Blood Portal. Monthly wastage reports from are also received from the Victorian Department of Health & Australian Red Cross Lifeblood.

The BMCRGC in collaboration with the Data Analytics and Insights Team have initiated and developed a Power BI Dashboard that supports data-driven decisions to improve practice for usage and wastage. Benchmarked data illustrating national wastage targets and benchmarked comparative data for state and national wastage rates has been included since the development of the Usage and Wastage Power BI Report. This information is accessible key stakeholders including the Program Director of Pathology and Pathology Managers at each Blood Bank site at Eastern Health.

The BMCRGC cultivates an inclusive culture that makes staff and consumer engagement a reality by engaging members on the committee to work as a team. The consumer representative was a co-author of a poster presentation at the international Blood 2024 Conference where a poster was presented on Blood Product Audit Data and Informatics.

The learnings gained from this new IT functionality and reporting have been immense and is now spreading and being applied to other clinical measures which we never thought possible a short time ago. Eastern Health achieved a new record low wastage rate of 1.7 % in 2023-2024. This result was replicated in 2024-2025.

REPORT

APPLICATION OF ACHS PRINCIPLES

1. Consumer Focus

The National Blood Authority (NBA) focuses on managing issues that pose a risk to the Australian blood sector, especially to continuous supply security. The Australian Red Cross Lifeblood (Lifeblood) is the only supplier of fresh blood products in Australia. It is the only organisation licensed by the Therapeutic Goods Administration (TGA) to collect blood for manufacturing blood and blood components.

We need more blood donors to stop the drop in blood supply and need to ensure the blood supply we have is not wasted. Every blood donation is separated into three components: red cells, plasma, and platelets. The level in the 'supply level' drops represents the number of bags ('units') of donated red cells of that blood type that Lifeblood holds after supplying hospital blood banks. At all times, Lifeblood needs to keep enough red cell units stocked and ready to meet expected demand. These levels go up and down based on how many units of each blood type is sent to hospitals and how many donors of that type have given blood recently. In July 2025, current red cell supply levels for all of Australia is illustrated in Appendix1- Figure 1:

Healthcare Services who have Transfusion Laboratories closely monitor usage and wastage of all blood components that are received from the generous donation of the Australian public to the Australian Red Cross Lifeblood. The Usage and Wastage Power BI Report at Eastern Health illustrates and benchmarks blood component usage and wastage data for the organisation and compares wastage to state and national levels. Key stakeholders from any location at Eastern Health can access the Usage and Wastage Power BI dashboard 24/7.

The development and testing of the Usage and Wastage Power BI Report in the Pathology setting centred on a design which incorporated consumers, health economics, capacity building, Data Analytics, Insights & Intelligence (DAIS) and translational principles. This multi-pronged approach provides reliable and necessary evidence and pathway for embedding a Usage and Wastage Power BI Dashboard into practice for system-wide change.

Executive Directors and Pathology Managers reported the Usage and Wastage Power BI Report as a valuable tool that improved visibility and detection of wastage variances for blood components monthly. Detection of clinical indicators that are in variance are investigated to determine why there is a variance. Pathology Managers reported the Usage and Wastage Power BI Report as a valuable tool that improved consistency in measurement of clinical indicators and assists with identification of clinical indicators that are in variance. Stakeholder comment included: “Amazing work Petra! Great way to display all the wastage stats, so easy to read. Thank you” (Anna- Principal Scientist & Blood Bank Senior Scientist).

2. Effective Leadership

The Usage and Wastage Power BI was conceived, developed, tested and implemented in partnership with the Data Analytics and Insights Service (DAIS) team. The project was a challenging undertaking which required the navigation of various healthcare systems that were multi-institutional where data for blood component usage, wantage and targets are retained.

This includes the National Blood Authority: BLOODNET and Australian Red Cross Lifeblood. It would not have been possible without the vision, influence and leadership of the leadership team at Eastern Health. Kalpesh Kothari was at that time the Associate Program Director- Analytics Business Partnering Data, Analytics and Insights

Service and introduced the Clinical Governance team to the possibility of developing Power BI reports. Jared De La Cruz (Business Intelligence Developer) was the primary contact for the development of the Eastern Health Power BI Dashboard for Usage and Wastage. Karen Mardegan (Director Clinical Governance - Corporate Services Accreditation & Assurance) was instrumental in encouraging and driving changes to the way we provide reports to the organisation to increase access and visibility of data.

Together, this multidisciplinary team of respected experts in their field, assisted in the development of the Usage and Wastage Power BI Dashboard. There was no additional funding required to develop this project. Through collaboration this team led the development of this innovative idea. This information is now accessible to all staff at Eastern Health. Relationships with Pathology Director, Pathology Managers and the Blood Management Clinical Risk Governance Committee and the finance team have strengthened by having this performance measure transformation at Eastern Health.

In the next step, Eastern Health submitted an abstract to present at the international Blood 2024 Conference which was accepted. The Blood conference is an international conference and is the combined Annual Scientific Meeting of the: Haematology Society of Australia and New Zealand, Australian and New Zealand Society of Blood Transfusion and the Thrombosis and Haemostasis Society of Australia and New Zealand. Petra Spiteri (Clinical Risk Manager: Blood Management) presented a poster at the conference in Brisbane in October 2024 as illustrated in Appendix 2.

These are essential outcomes that highlight the value of the Usage and Wastage Power BI Dashboard in providing presentation of data that is standardised, benchmarked and best practice. Coherent information exchange that is easily accessible and visible to staff that work in a fast paced, stressful environment creates a collegial working environment.

3. Continuous Improvement

The methodology used was based on Safer Care Victoria Plan, Do, Study, Act Cycles. The PLAN phase clearly defined tasks and activities that will be undertaken and who will carry out the plan. The department involved in development of the project was the Data Analytics and Insights Service (DAIS) team. Ownership was another essential element to consider. At Eastern Health the Blood Management Clinical Risk Governance Committee is the owner of the Usage and Wastage Power BI Dashboard. The location of the Power BI Dashboards can be found on the Power BI App link from the Eastern Health intranet.

The type of data and information collected was considered and focused predominantly on blood component usage and wastage. The possibility of benchmarking results was an important factor considered to identify comparisons and variations compared to state and national particularly with regards to blood wastage. It needs to be acknowledged that there are currently limitations to what data can be collected and analysed.

The Usage and Wastage Power BI report combines frameworks that was originally developed to provide usage and wastage information of fresh blood products. The data combines information from the National Blood Authority BLOODNET and from the Australian Red Cross Lifeblood. The report from the National blood Authority provides monthly data for fresh blood products issued and associated costs. The Australian Red Cross Lifeblood provides data for fresh blood products discarded which may be categorised as wasted. The reasons why any fresh products are discarded will determine whether it was preventable wastage.

The DO phase was the execution of the plan or idea. It was important to do the activity and training. The doing phase was several short training sessions, approximately 1-2 hours long provided by the DAIS team demonstrating their expert skills in relation to what is possible with Power BI reporting. This included 1) Power BI Introductory Training, 2) Intermediate Workshop Presentation And 3) Advance Workshop Presentation.

After training was carried out the Clinical Risk Manager: Blood Management collaborated with the DAIS team to develop the first version of the Usage and Wastage Power BI report. Although the plan was delivered, there were some unexpected events and problems that were encountered. The Usage and Wastage Power BI report was only visible to staff who had a specific IT licence. To enable visibility of the Power BI report staff required access to be grated to enable viewing of the Usage and Wastage Power BI Report.

During the STUDY phase of this project, adaptation for user access was required to support access and visibility of the Usage and Wastage Power BI report to healthcare professionals across Eastern Health. The CRM: Blood Management continued to communicate with the DAIS Team to enable a link to be created within the Power BI App which enables visibility for any healthcare professionals at Eastern Health.

The final step was a decision for adoption of the Power BI Report by the BMCRGC and the Executive team. Data from the Usage and Wastage Power BI Report was first incorporated into the Annual Usage and Wastage Report 2023-2024. (Refer to Appendix 3). The Blood Management Committee and Executive team are key stakeholders who have a vested interest in these results. Feedback from the Director of Pathology has included that she monitors Usage and Wastage without needing to wait for e-mails to be sent in relation to this monthly data.

A systematic approach illustrates fresh blood product usage and wastage numbers and costs associated with both. Since the Usage and Wastage Power BI Dashboard has undergone several iterations informed by feasibility, efficacy and adaptability. It is now scaled up to be live and accessible to staff from the Eastern Health intranet site.

4. Evidence of Outcomes

The Power BI Dashboard and Report allows efficient, concise presentation of data for multiple blood products including monthly and yearly comparison from various sources, along with integration of national targets. The first Annual Usage and Wastage Report using Power BI was presented to the EH Blood Management Committee in September 2024. Author analysis can be documented to aid interpretation of results. This has enabled ongoing improvement in data reporting, dissemination of information and decision making. Power BI allows users to share dashboards and reports with others within the healthcare organisation.

The implementation of the Power BI Report illustrated the total usage of fresh blood products reached a new record high for EH when compared to previous years. 14,858 blood products were issued for financial year 2023-2024 costing $4,719,24. There was a 20% increase compared to the previous financial year. In contrast, total wastage of fresh blood products reached a new record low for EH when compared to previous years. 254 blood products were wasted for financial year 2023-2024 costing $53,025. This equated to a new record low overall wastage rate of 1.7%. (Refer to Appendix 3)

Is this result sustainable? For Financial year 2024-2025, the total usage of fresh products decreased slightly when compared to the previous year. 13,877 blood products were issued costing $4,452,898. A total of 239 blood products were wasted costing $57,619. Pleasingly, the total percentage of fresh blood products wasted has maintained at the same record low as the previous year where a new record low was set at 1.7% for Eastern Health. (Refer to Appendix 4)

5. Striving for Best Practice

Although many of our hospitals and services hold a special place in the lives of our communities, it is our people that are our difference. At Eastern Health we have worked together to bring together information in the form of data from a much larger Victorian health system. Working closely with partners and with the Department of Health to support a transformation necessary to ensure an accessible, visible and high quality and sustainable health care. Our community is changing, and there are increasing health, social and economic pressures. Understanding these changes informs and reforms the way we think about the future of reporting data measurements for our health service.

Technology driven change offers us opportunity to do things we have never been able to do before, and to do things faster, cheaper and more effectively. It creates an exciting future. It also requires us to be able to invest in both the uplift of our current technology and our ability to apply it to better meet the needs of our community.

We will continue to find new ways of working, building our capability to make the best use of the technology we have, whilst working to bring online new and exciting developments that can help us transform care and how we communicate as an organisation.

Power BI Reporting for Usage and Wastage has several key strengths:

1. It has a user-friendly interface: Power BI has an intuitive interface allowing users to visualize and analyse data easily.
2. Data integration: Power BI allows users to easily integrate data from various sources, including the National Blood Authority and Australian Redcross Lifeblood
3. Customisable dashboards: Users can create customized dashboards and reports to display data in a way that is meaningful to them
4. Real-time data: Power BI supports real-time data processing, which means users can view up-to-date data in their dashboards and reports
5. Collaboration: Power BI allows users to share their dashboards and reports with others, making collaborating on data analysis projects easy.

Working together we continuously improve and optimise our resources and partner to create better outcomes for our community. Whether it is the precious blood that is donated from generous members of our community or consumer's receiving lifesaving blood transfusions, we pursue opportunities to deliver modern, fit for purpose systems, services and data that enable us to display and promote data-driven culture and enable informed decision making. There is a value adding link between, clinicians, DAIS technical teams and stakeholders to support strategic objectives. Clever use of informatics may help to reduce waste in our systems and services through innovation.

INNOVATION IN PRACTICE AND PROCESS

This innovative idea came to fruition through collaboration between several departments and services at Eastern Health. Health. Stakeholders who are aware, promote and support the development of Power BI Dashboards are far-reaching.

The Usage and Wastage Power BI report was created to:

1. present the monthly Blood Usage and Wastage Data using new IT based functionality (Power BI),
2. benchmark data on organisational, state and national levels,
3. provide key stakeholders from any location with 24/7 access to the Usage and Wastage Power BI dashboard.

It is a unique, targeted report that is now 'live' for viewing by any member of staff at Eastern Health at any time.

It has been showcased at the International Blood 2024 Conference and is highly transferable and adaptable to different contexts where data exists and may potentially be used for larger scale rollouts.

APPLICABILITY TO OTHER SETTINGS

Power BI Reporting is a new way of thinking- it creates a culture of 'data driven thinking' that is objective. It focuses on how we define, find and gather required data. Power BI reporting can interpret data using basic statistical concepts. The steps of the Data journey may be applied to many different settings.

The first step is to define, find and gather data. This helps in preparing a data analysis plan. A data analysis plan is a roadmap for how to organise and analyse a study, survey or data—and it should help you achieve the objectives that are set and relate to the goal you. It is essential to determine intended accomplishments and whether operational or strategic goals can be achieved.

It is essential to consider resources available, constraints, and assumptions. An analysis plan helps think through the data that will be collected, what the data will be used for, and how it will be analysed. Creating an analysis plan is a critical way to ensure that all the necessary data is collected and that the collected data is effectively utilised.

The second step is to explore, clean and describe the types of data. Data needs to be able to be imported into excell. This assists with an overview of the type of data analysis. Basic statistical tools which may be enabled include measures of central tendencies, measures of dispersion and correlation.

Communicating and networking with key stakeholders enables teamwork and buy-in among healthcare stakeholders and assists in fostering a culture shift toward data-driven decision-making. Data-driven thinking is when an individual or an organisation makes decisions based on facts and evidence backed by data analysis, instead of emotions and intuitions. Due to the increasing availability of data, advances in technology, and growing business complexities, data-driven decision-making methods are becoming more reliable than traditional decision-making methods.

The probability of negative consequences resulting from a decision is low when using Power BI reports for decision-making. Data-driven decisions promote more objective and informed decision-making. Power BI reporting makes it easier to see if improvement activities are having an impact. The goal is for data-driven decisions to lead to improved organisational performance.

Broader clinical roll out including measures of Power BI Report outcomes are ongoing and pending, dependent on future funding. The framework and evaluation of this initiative has positively influenced the approach and development of other Power BI Dashboard builds at Eastern Health and quality improvement projects at Eastern Health.

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Data Analytic Insights Service (DAIS):

- Power BI Introductory Training
- Intermediate Workshop Presentation
- Advance Workshop Presentation

Jared De La Cruz (Business Intelligence Officer)
Collaboration to build two Power BI Dashboards for Standard 7: Blood Management

1. Usage and Wastage Power BI Report
2. Zero Tolerance Power BI Report

Karen Mardegan (Director Clinical Governance- Corporate Services Accreditation & Assurance)
For the supporting the "Blood Product Audit Data and Informatics" Poster Presentation at the Blood 2024 Conference

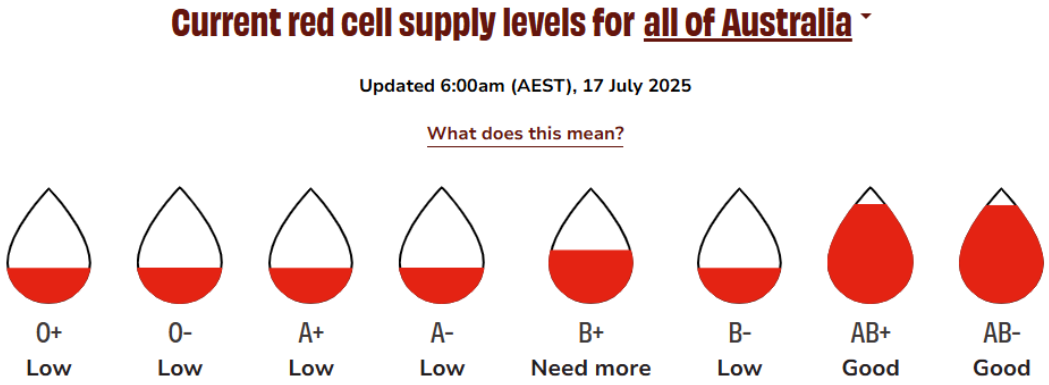
Members of the Blood Management Clinical Risk Governance Committee (BMCRGC)
Special mention to Jane Allardice (Eastern Health Consumer Representative on the BMCRGC)

USEFUL LINKS AND RESOURCES FOR POWER BI REPORT BUILDING:

1. PowerBI Desktop and server compatibility
2. Get Power BI Desktop
3. Microsoft Power BI Online Training Courses
4. Power BI – Dashboard in a Day
5. Power BI documentation

APPENDIX

Appendix 1: Red cell supply levels for all of Australia on the 17th July 2025 is illustrated in Figure 1



Appendix 2

Blood Product Audit Data and Informatics:
Initiatives that support data-driven decisions to improve practice

Eastern Health

Authors: Jane Allardice (Eastern Health Consumer Representative on Blood Management Clinical Risk Governance Committee), Dr Marija Borosak (Head of Laboratory Haematology), Dr Andrew Maclean (Emergency Physician, Short Stay Medicine Clinical Lead), Naida Lumsden (Director of Midwifery/Deputy Director Operations Women & Children), Petra Spiteri (Clinical Risk Manager - Blood Management), Lacey Strachan (Associate Director - Learning & Teaching Specialist & Advanced Practice)

Acknowledgments: Jared De Ca Cruz (Business Intelligence Developer), Kalpesh Kothari (Associate Director - Analytic Business Partner), Karen Mardegan (Director Clinical Governance - Corporate Services Accreditation & Assurance), Sarah Webb (Director of Nursing BHI, Critical Care & Access Program), Toni Gutschlag (Executive Director, Mental Health & Clinical Support)

1 Introduction

Manual transfusion audits started as an academic exercise to measure practice improvement and key performance indicators. Today, a booming and fast changing IT platform supports transfusion auditing processes to transition from the original academic exercise, to methods that are innovative, practical, and exciting.

2 Aim

By August 2024:

- Present the monthly Blood Product Usage and Wastage data using new IT based functionality (Power BI).
- Benchmark data on organisational, state and national levels.
- Provide key stakeholders from any location with 24/7 access to the Power BI dashboard.

3 Methodology

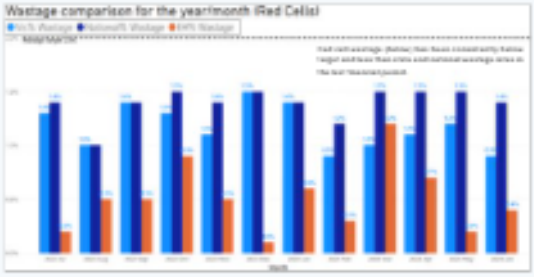
Plan: Considered how current data is captured and IT opportunities available.

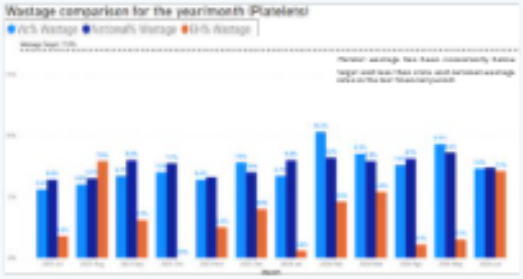
Do: Attended Power BI training session provided by EHI Data Analytics Team.

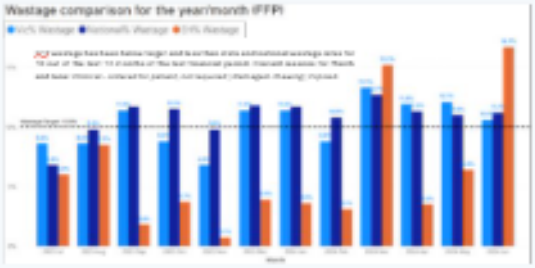
Study: Liaised with Data Analytics team to develop Power BI Dashboard for Blood Product Usage and Wastage.

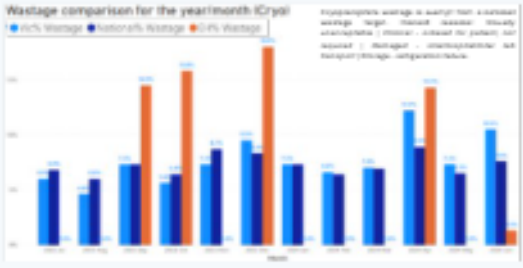
Act: Engaged stakeholders by using Power BI Dashboard to generate the Annual Usage and Wastage Report 2023-2024.

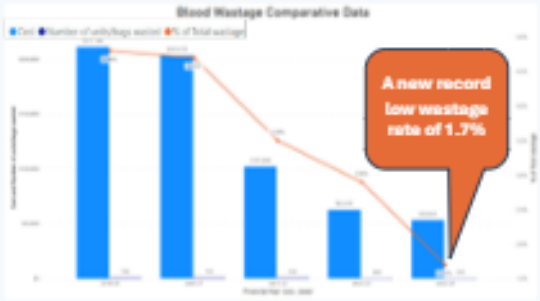
4 Power BI Usage and Wastage for 2023-2024 Financial Year











5 Limitations

- Power BI Dashboards need to be published on Power BI Service in the cloud using Power BI Pro licence for sharing with stakeholders within an organisation.
- Administration and licencing of Power BI is a consideration for its use.
- Power BI requires stakeholders to be given access to the Power BI Dashboard.

6 Results/Findings

- The Power BI Dashboard and Report allows efficient, concise presentation of data for multiple blood products including monthly and yearly comparison from various sources, along with integration of national targets.
- Author analysis can be documented to aid interpretation of results.
- The first Annual Usage and Wastage Report using Power BI was presented to the EHI Blood Management Committee in September 2024.
- Enables ongoing improvement in data reporting, dissemination of information and decision making.
- Power BI allows users to share dashboards and reports with others.

7 Conclusion

- The Power BI Dashboard for Usage and Wastage uses technology as a new way of providing and presenting Usage and Wastage for an organisation which is compared with state and national levels and benchmarked against targets set by the Department of Health.
- Trends, changes, improvements, areas of concern or focus can easily be identified.
- Further research is needed for accessibility, usage and understand the effects the Power BI Dashboard and Report may have amongst different professional groups.
- ***Stakeholder comment: "Amazing work Petra! Great way to display all the wastage stats, so easy to read. Thank you"***
  (Anna- Principal Scientist & Blood Bank Senior Scientist)

References: National Blood Authority; BLOODNET, Victorian Department of Health & Australian Red Cross Lifeblood

Appendix 3

Eastern Health

Annual Blood Usage and Wastage Report 2023-2024

Eastern Health Blood Usage and Wastage Report: July 2023 - June 2024

National Safety and Quality Healthcare Standards for Standard 7: Blood Management (NSQHS) includes:

- Action 7.02 Monitoring performance and reporting outcomes of blood management.
- Action 7.09 Trace blood and blood products from entry, to transfusion, discard, or transfer.
- Action 7.10 Manage availability of blood and eliminate avoidable wastage.

The Blood Management Clinical Risk Governance Committee (BMCRGC) focuses on ensuring the safe and appropriate use of blood across Eastern Health. Data is extracted and monitored for blood usage and wastage on a monthly basis from the National Blood Authority: Blood Portal as well as receiving monthly wastage reports from the Victorian Blood Matters Program.

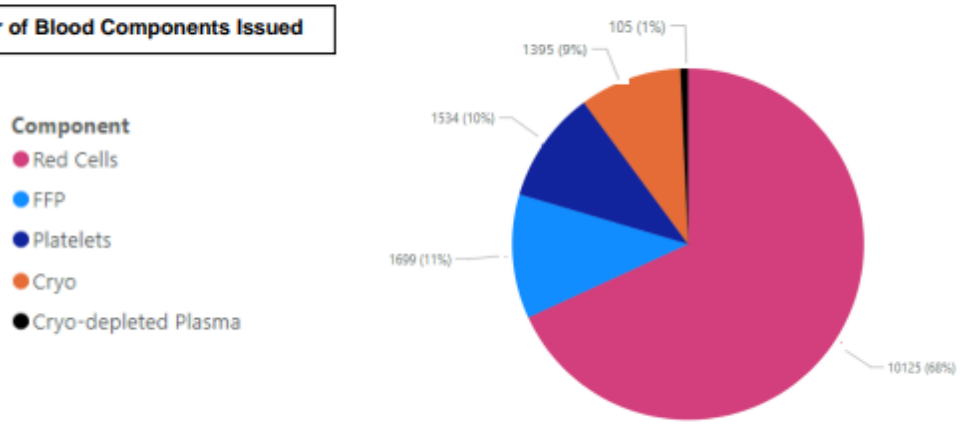
A new Power BI Report for Usage and Wastage has been introduced which includes comparison wastage data at state and national levels.

This information is distributed to the Head of Laboratory Haematology, Program Director of Pathology and Senior Scientists at each Blood Bank site, which includes Angliss, Box Hill, and Maroondah every month. Wastage data is included in the Blood Management Scorecard and discussed at the BMCRGC Committee meetings on a bimonthly basis.

The Usage and Wastage Power BI Report for Financial Year July 2023 - June 2024 is now accessible on Sharepoint.

Blood Components Issued Data is extracted from National Blood Authority. (below)

Total Number of Blood Components Issued



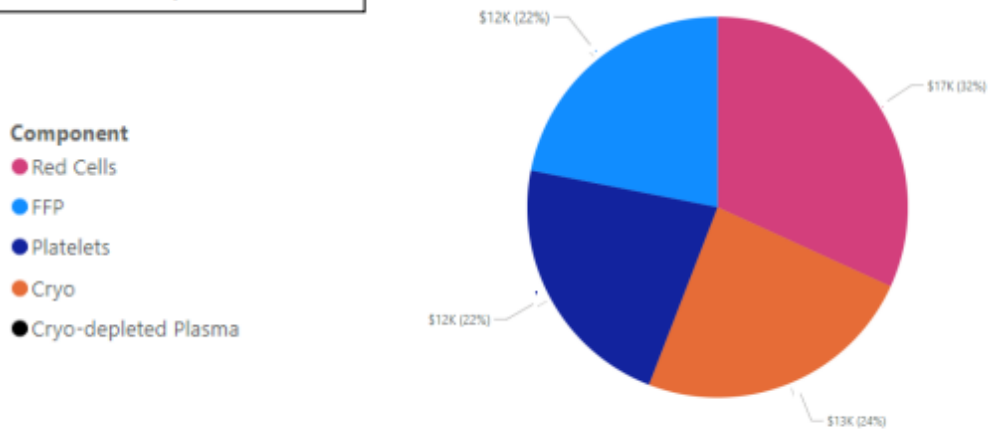
Total Blood Components Issued

Blood Component	Annual No. Issued	Annual Cost
Red Cells	10,125	$3,6000,434
Platelets	1,534	$479,748
FFP	1,699	$329,634
Cryo	1,395	$295,242
Cryo-depleted plasma	105	$16,274
Total	**14,858**	**$4,721,332**

Prepared by Petra Spiteri (Clinical Nurse Consultant) on behalf of BMCRGC

Blood Component Wastage Data is received from Victorian Blood Matters Program (below)

Total Number Blood Components Wasted

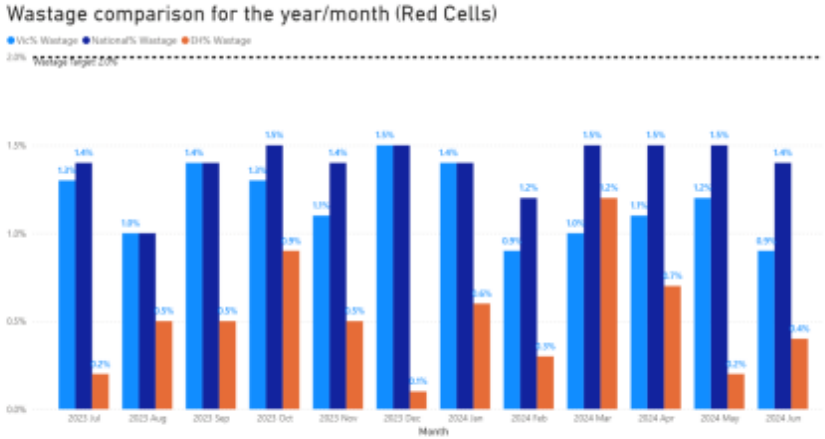


Total Blood Components Wasted Cost

Blood Component	Annual No. Wasted	Annual Cost
Red Cells	52	$16,875
Platelets	49	$11,780
FFP	78	$11,615
Cryo	74	$12,754
Cryo-depleted plasma	1	$0
Total	**254**	**$53,024**

Wastage target is set by the Department of Health and Human Services (DHHS). Wastage target differs for each fresh component. Benchmarked data which illustrates national wastage targets and benchmarked comparative data for state and national wastage rates has been included since the development of the Usage and Wastage Power BI Report.

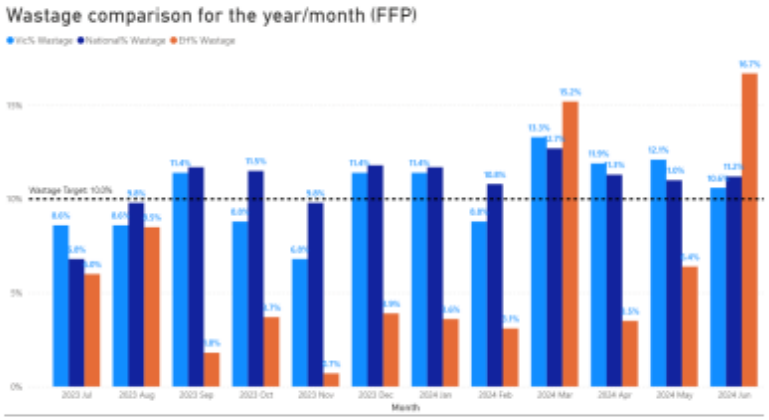
Red cell wastage has been consistently below target and less than state and national wastage rates in the last financial period. Wastage target is 2%(below).



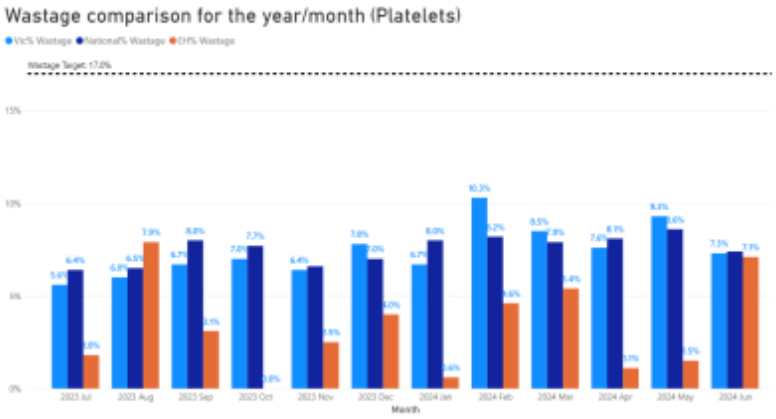
Prepared by Petra Spiteri (Clinical Nurse Consultant) on behalf of BMCRGC

FFP wastage has been below target and less than state and national wastage rates for 10 out of the last 12 months of the last financial period. March and June 2024 were the exception. Wastage target is 10% (below) Discard reasons for those two months in particular include:

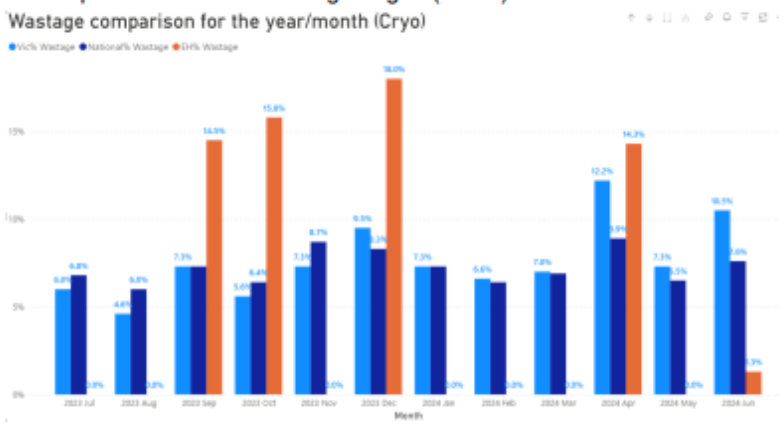
- Clinically ordered for patient, not required
- Damaged- thawing
- Expired- thawed frozen product
- Other



Platelet wastage has been consistently below target and less than state and national wastage rates in the last financial period. Wastage target is 17% (below)

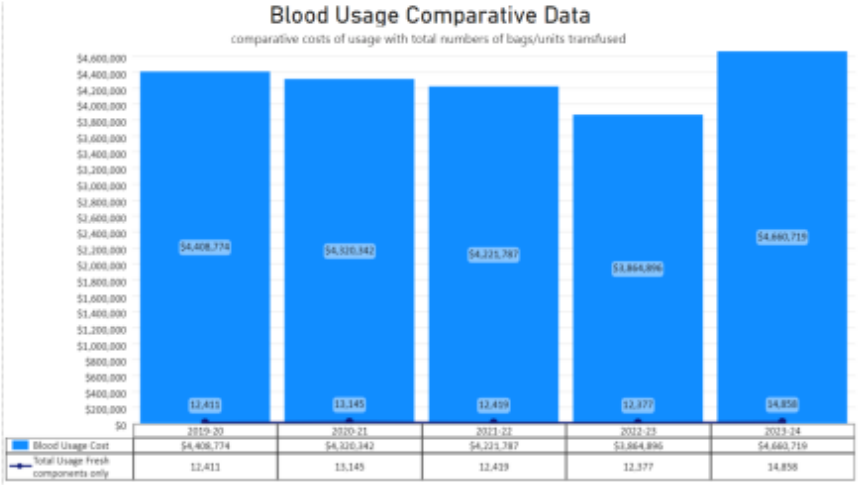


Cryoprecipitate wastage is exempt from a national wastage target. (below)

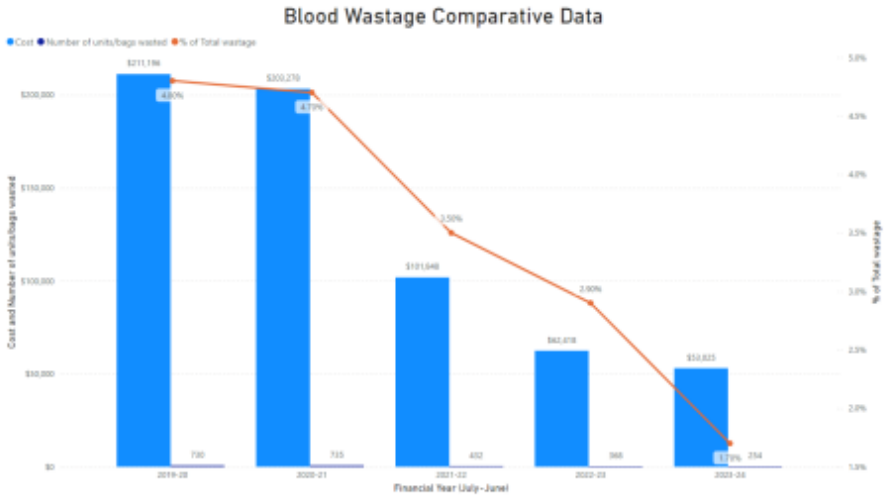


Prepared by Petra Spiteri (Clinical Nurse Consultant) on behalf of BMCRGC

Total usage of fresh blood products has reached a new record high for EH when compared to previous years.14,858 blood products were issued for financial year 2023-2024.



Total wastage of fresh blood products has reached a new record low for EH when compared to previous years. 254 blood products were wasted for financial year 2023-2024.



Conclusion

During 2023/2024 EH has transfused more fresh blood products than previous years There has been a 20% increase compared to the previous financial year. There has been progressive improvement in wastage when compared to previous years.

A total of 254 blood products were wasted, costing $53,025. A total of 14,858 blood products were issued, costing $4,719,24. This equates to a new record low wastage rate of 1.7%.

Appendix 4

Eastern Health

Annual Blood Usage and Wastage Report 2024-2025

Clinical Risk	**Blood Management**
Executive Sponsor	**Toni Gutschlag (Chair of Blood Management Clinical Risk Governance Committee)**
Clinical Lead	**Petra Spiteri (Clinical Risk Manager: Blood Management)**
Reporting Period	**July 2024 – June 2025**

1. Standards against which organisation wide performance is monitored

National Safety and Quality Healthcare Standards for Standard 7: Blood Management (NSQHS) includes:

- Action 7.02 Monitoring performance and reporting outcomes of blood management.
- Action 7.09 Trace blood and blood products from entry, to transfusion, discard, or transfer.
- Action 7.10 Manage availability of blood and eliminate avoidable wastage.

2. Performance and Improvement

a. Clinical Practice

The Blood Management Clinical Risk Governance Committee (BMCRGC) focuses on ensuring the safe and appropriate use of blood across Eastern Health. Data is extracted and monitored for blood usage and wastage monthly from the National Blood Authority: Blood Portal as well as receiving monthly wastage reports from the Victorian Blood Matters Program.

Two key achievements include:

- The Usage and Wastage Power BI Report increasing access and visibility of this information across the organisation.
- Presenting Blood Product Audit Data and Informatics at the Blood 2024 Conference in October 2024 where Power BI Usage and Wastage was showcased.

b. Leadership and Culture

c. Consumer Participation

The BMCRGC cultivates an inclusive and just culture that makes staff and consumer engagement a reality by engaging members on the committee work as a team and include the Consumer Representative as co-authors of the Poster Presentation at the Blood 2024 Conference. The BMCRGC in collaboration with the Data Analytics and Insights Team has initiated and developed a Power BI Dashboard that support data-driven decisions to improve practice.

d. Workforce

This information is distributed to the Program Director of Pathology and Pathology Managers at each Blood Bank site, which includes Angliss, Box Hill, and Maroondah every month. Wastage data is included in the Blood Management Scorecard and discussed at the BMCRGC Committee meetings on a bimonthly basis.

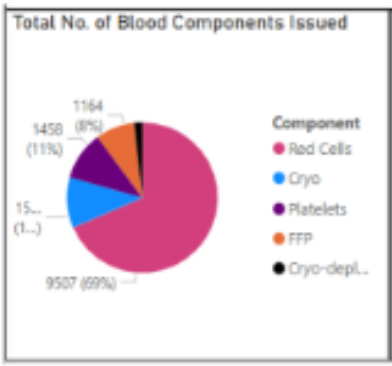
The Usage and Wastage Power BI Report for Financial Year July 2024 - June 2025 is now accessible on SharePoint.

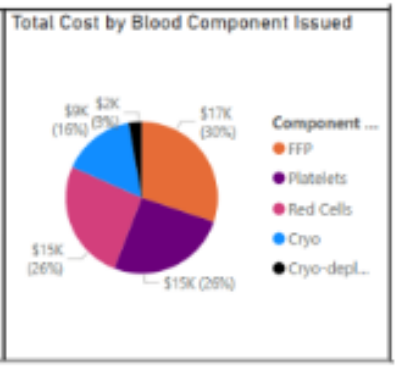
3. Blood Usage for Financial Year July 2024 - June 2025

Blood Components Issued Data is extracted from National Blood Authority.
(Table 1 below)

Type / Month	Cryo Issued	Total Cost	Cryo-depleted Plasma Issued	Total Cost	FFP Issued	Total Cost	Platelets Issued	Total Cost	Red Cells Issued	Total Cost	Total Issued	Total Cost
2024 Jul	109	18,625.19	21	3,254.79	147	23,476.20	75	24,543.74	848	318,207.58	**1200**	**388,311.50**
2024 Aug	175	28,735.10	13	2,014.87	81	14,121.73	114	35,295.94	852	245,280.49	**1235**	**325,448.33**
2024 Sep	89	15,159.37			14	2,228.94	88	31,474.94	688	260,835.17	**879**	**309,698.42**
2024 Oct	133	19,792.51	12	2,059.72	81	14,075.41	119	38,503.51	863	319,624.43	**1209**	**395,055.58**
2024 Nov	244	42,454.57	12	1,901.28	28	4,457.88	110	37,099.90	778	288,141.47	**1172**	**374,055.10**
2024 Dec	117	20,465.04	19	6,201.79	150	24,343.36	159	56,209.96	845	313,163.17	**1290**	**420,383.32**
2025 Jan	109	19,537.02	0	0.00	65	10,942.47	152	51,727.67	877	324,784.40	**1203**	**406,991.56**
2025 Feb	95	16,265.31			69	11,315.39	153	56,683.09	802	297,250.16	**1119**	**381,543.95**
2025 Mar	100	17,150.04			50	8,356.38	139	47,805.49	806	301,503.40	**1095**	**374,815.31**
2025 Apr	45	7,668.73			41	6,723.68	136	46,739.28	688	254,835.15	**910**	**315,996.84**
2025 May	140	23,970.94	116	18,423.14	335	54,457.01	117	42,778.87	752	278,746.87	**1460**	**418,376.83**
2025 Jun	152	26,048.78	46	7,312.20	103	16,962.45	96	26,631.17	708	262,226.57	**1105**	**342,221.36**
Total	**1508**	**256,136.80**	**240**	**41,167.98**	**1164**	**192,290.90**	**1458**	**498,493.56**	**9507**	**3,464,808.86**	**13877**	**4,452,898.10**

Pie Graph 1 (right) illustrates the total number and percentage of the total number of blood components issued.





Pie Graph 2 (left) illustrates the total cost and percentage of the total cost of blood components issued.

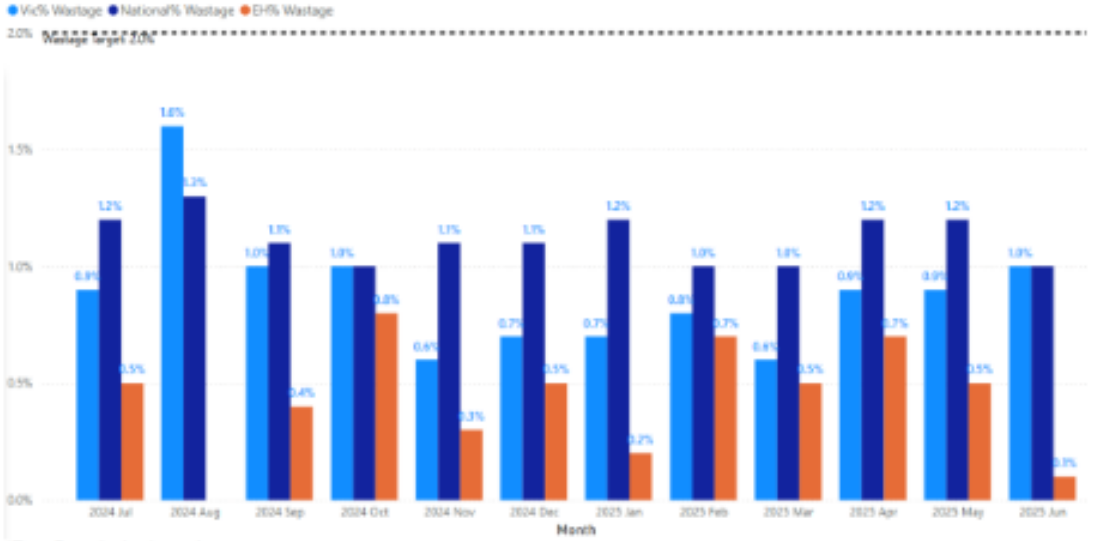
4. Blood Wastage for Financial Year July 2024 - June 2025

Blood Components Wastage Data is provided by Australian Red Cross Lifeblood.
(Table 2 below)

Type / Month	Cryo Net Issues (ARCLife Blood)	Wastage	Cost	Cryo-depleted Plasma Net Issues (ARCLife Blood)	Wastage	Cost	FFP Net Issues (ARCLife Blood)	Wastage	Cost	Platelets Net Issues (ARCLife Blood)	Wastage	Cost	Red Cells Net Issues (ARCLife Blood)	Wastage	Cost	Total Net Issues (ARCLife Blood)	Wastage	Cost
2024 Jul	113	0	$0		0		147	9	$1,402	75	17	$3,033	849	4	$1,500	**1184**	**30**	**$8,735**
2024 Aug	175	0	$0	0	0	$0	81	2	$312	114	8	$2,842	852	1	$375	**1222**	**11**	**$3,529**
2024 Sep	89	0	$0				14	4	$769	88	6	$1,833	688	3	$1,110	**879**	**13**	**$3,712**
2024 Oct	133	0			0		81	7	$1,246	119	1	$256	862	7	$2,590	**1195**	**15**	**$4,092**
2024 Nov	244	21	$3,577		2	$317	28	8	$1,340	110	1	$256	778	2	$740	**1160**	**34**	**$6,230**
2024 Dec	3	5	$852	0	0	$0	150	7	$1,114	159	1	$256	845	4	$1,480	**1157**	**17**	**$3,702**
2025 Jan	99	0	$0	0	1	$326	65	10	$2,054	152	1	$256	871	2	$740	**1187**	**14**	**$3,376**
2025 Feb	95	0	$0				69	4	$637	155	0	$0	802	6	$2,220	**1121**	**10**	**$2,857**
2025 Mar	70	0	$0				83	25	$4,358	123	1	$555	630	4	$1,480	**906**	**30**	**$6,393**
2025 Apr	45	0	$0				29	3	$544	136	1	$555	688	5	$1,850	**898**	**9**	**$2,949**
2025 May	334	28	$4,205		4	$633	105	7	$2,687	577	3	$1,110	188	1	$370	**1204**	**41**	**$9,007**
2025 Jun	1	2	$344	0	2	$317	6	3	$928	3	5	$1,378	75	1	$370	**87**	**15**	**$3,537**
Total	**1401**	**54**	**$8,978**	**0**	**9**	**$1,595**	**858**	**91**	**$17,381**	**1813**	**45**	**$14,830**	**8128**	**40**	**$14,825**	**12200**	**239**	**$67,619**

Wastage target is set by the Department of Health and Human Services (DHHS). Wastage target differs for each fresh component. Benchmarked data which illustrates national wastage targets and benchmarked comparative data for state and national wastage rates has been included since the development of the Usage and Wastage Power BI Report.

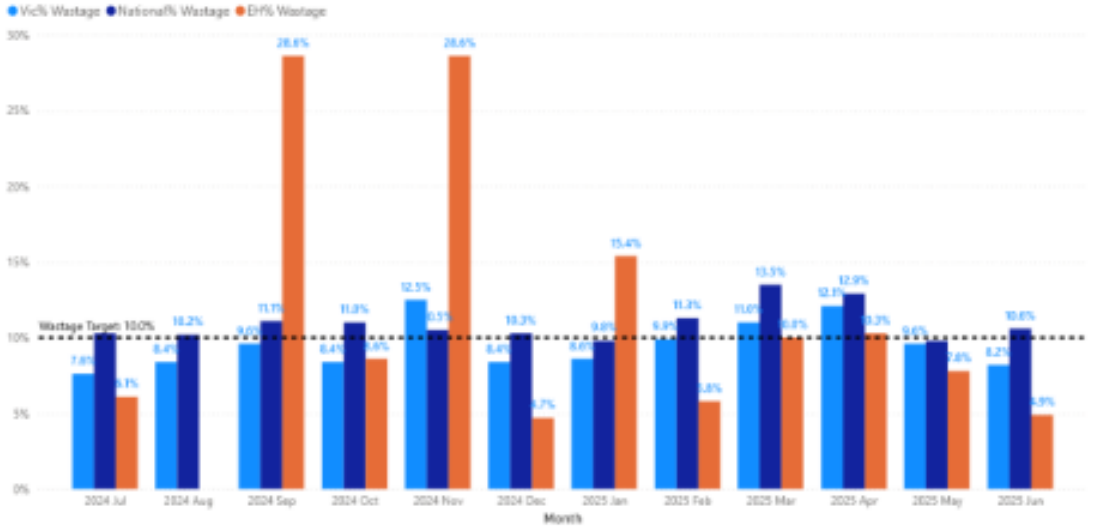
Wastage comparison for the year/month (Red Cells)



(Bar Graph 1 above)

Red cell wastage has been consistently below target and less than state and national wastage rates in the last financial period. Wastage target is 2% (below).

Wastage comparison for the year/month (FFP)

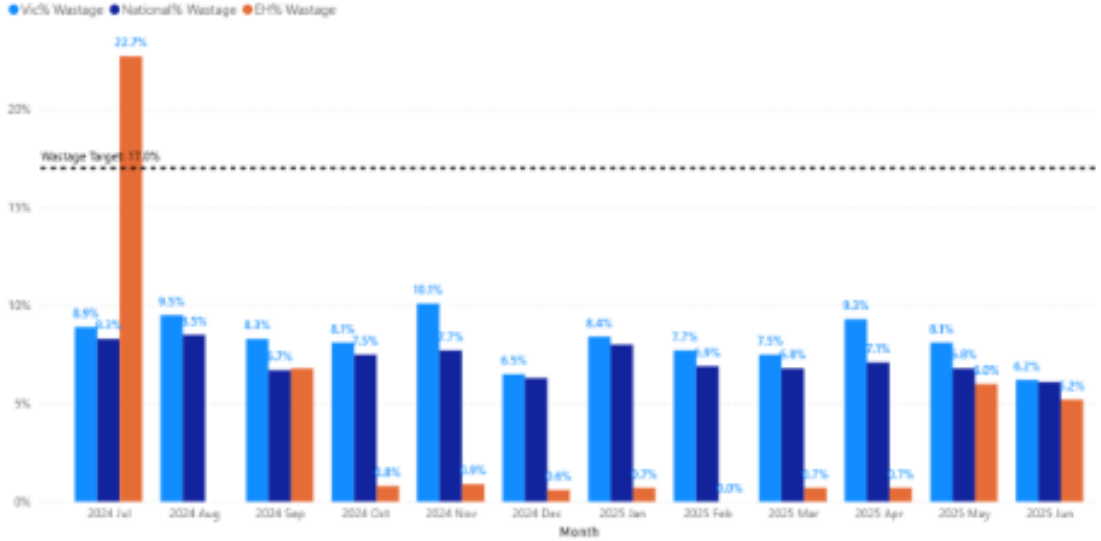


(Bar Graph 2 above)

FFP wastage has been below target and less than state and national wastage rates for 9 out of the last 12 months of the last financial period. September, November 2024 and January 2025 were the exception. Wastage target is 10% (below). Discard reasons for those three months include:

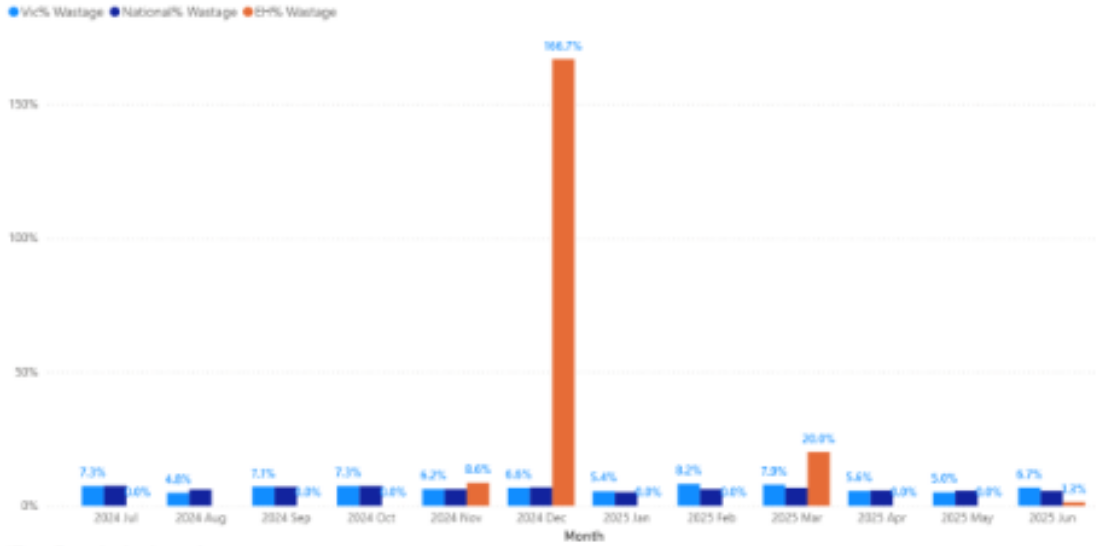
- Clinically ordered for patient, not required
- Damaged- thawing
- Expired- thawed frozen product
- Damaged on ward

Wastage comparison for the year/month (Platelets)



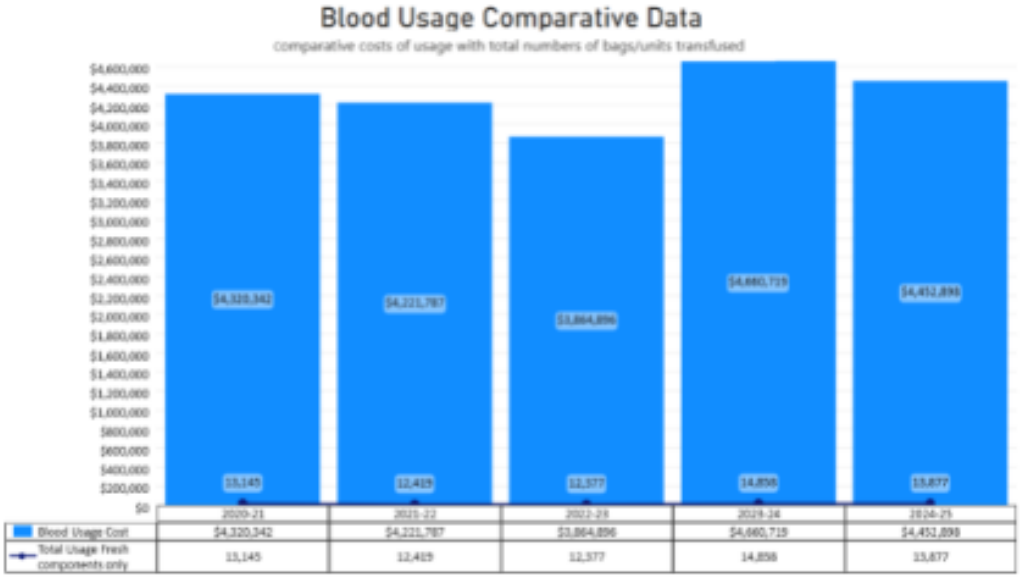
(Bar Graph 3 above)
Platelet wastage has been consistently below target and less than state and national wastage rates in the last financial period every month. July 2024 was the only exception, with the reason platelets were discarded was due to time expired. Wastage target is 17% (below).

Wastage comparison for the year/month (Cryo)



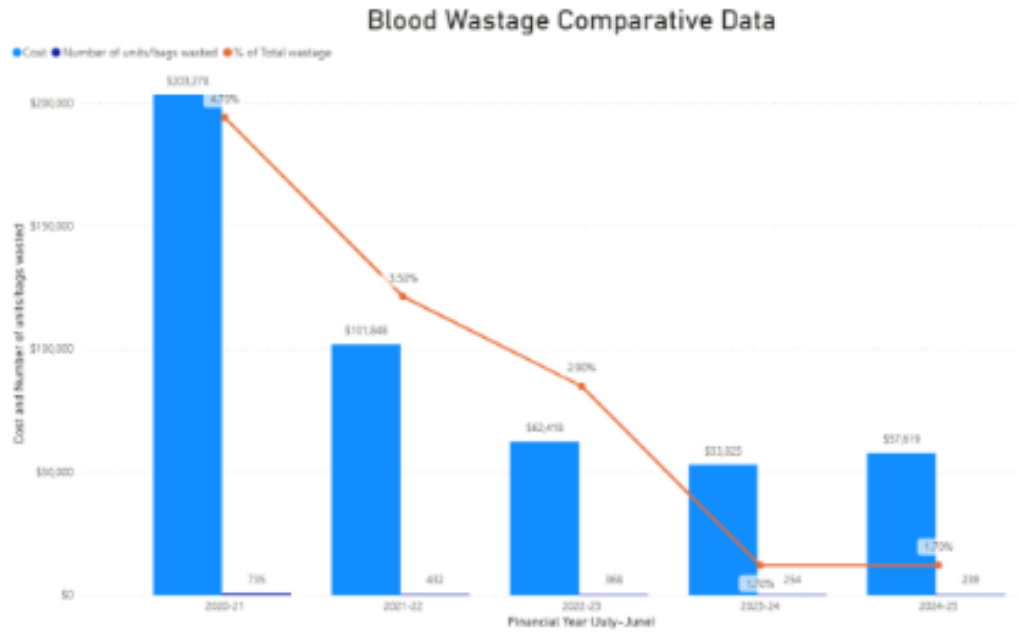
(Bar Graph 4 above)
Cryoprecipitate wastage is exempt from a national wastage target. The December peak reflects two requests of 15 units in total. In both cases, units were thawed but not transfused. Discard reason- *"Clinical – ordered for patient, not required."*

Summary over the last 12 months



(Bar Graph 5 above)

Total usage comparative data of fresh blood products for the previous 5 years is displayed. The total usage of fresh products decreased slightly when compared to the previous year. 13,877 blood products were issued for financial year 2024-2025.



(Bar Graph 6 above)

Total wastage comparative data of fresh blood products for the previous 5 years is displayed. 239 blood products were wasted for financial year 2024- 2025.

Conclusion
During financial year 2024-2025 EH transfused 7% less fresh blood products compared to the previous year. A total of 13,877 blood products were issued costing $4,452,898. A total of 239 blood products were wasted costing $57,619. The total percentage of fresh blood products wasted has maintained the same as the previous year where a new record low was set at 1.7% for Eastern Health.

Prepared by: Petra Spiteri (Clinical Risk Manager: Blood Management)

HEALTHCARE MEASUREMENT

HIGHLY COMMENDED

Hunter New England Local Health District (HNELHD), NSW

Supportive Care for Chronic Disease

Mind & Matter: psychiatry in chronic disease

Troy Arnold, Laureate Prof John Attia, Lauren Johnson, Prof Brian Kelly AM, Sarah Pullen, Dr Shalini Rajan, Dr Sharon Ryan, and Prof Katie Wynne

AIM

To evaluate the impact of embedded psychiatric care within a transdisciplinary supportive care model on clinical, psychosocial, and health service utilisation outcomes for patients living with advanced non-malignant chronic disease and comorbid mental health concerns. Supportive Care for Chronic Disease PLUS (SCCD+) integrates a Consultation-Liaison Psychiatrist and Registrar within the Supportive Care for Chronic Disease (SCCD) team to deliver timely, collaborative, person-centered mental health care. Unmet mental health needs are self-identified by patients and carers through the structured use of validated measures and during SCCD consultations. By addressing these needs, the model aims to reduce unplanned hospital use, enhance patient and carer wellbeing, and support access to a model of integrated care that is sustainable and scalable across regional, rural and remote settings.

SUMMARY ABSTRACT

Mental health concerns among individuals with advanced chronic disease are prevalent, often severe, and frequently under-recognised (NCHPC, 2022; Niklas, 2022). Symptoms including depression, anxiety, and existential distress impact quality of life, symptom burden, and reliance on acute health services. In 2022, the Hunter New England Local Health District (HNELHD) Supportive Care for Chronic Disease (SCCD) team identified a significant gap in addressing mental health within palliative and end-of-life care settings. A preliminary review of patient-reported outcomes and clinical observations revealed a high prevalence of untreated psychological distress among both patients and carers (Appendix 1 Figure 1).

In response, the SCCD+PISCES (Psychiatry in Supportive Care Evaluation Study) pilot was developed as a 15-month initiative under the NSW Ministry of Health's Enhancing Community Care program (NSW MoH, 2022). The model integrated psychiatric expertise into the SCCD service to improve identification, triage, and management of psychological distress in people with chronic and life-limiting illnesses. SCCD+PISCES relied on routine use of validated patient-reported outcome measures, including the Integrated Palliative Outcome Scale (IPOS), the EuroQol 5 Dimension 5 Level (EQ 5D 5L), and the carer variant, Carer Experience Scale (Appendix 1 Table 1.). These tools, completed electronically prior to scheduled SCCD consultations, enabled real-time identification of emotional, psychological, social, and existential concerns.

During SCCD+PISCES, the data-informed screening process allowed timely escalation to psychiatric input, supported by a 0.2 FTE consultation-liaison psychiatrist embedded within the multidisciplinary team. The psychiatrist also provided professional development to clinicians, enhancing the team's capacity to respond to mental health needs. Weekly case conferences including the psychiatrist, SCCD social worker and team leader, enabled triage of referrals into three response pathways (Appendix 2 Figure 2.): direct psychiatry clinic consultation, advice to treating clinicians (general practitioners and specialist teams), or intensified social work

support. Referral criteria were developed in collaboration with patients, carers, and clinicians from chronic disease, palliative care, and mental health services (Appendix 2 Table 2).

Over the 15-month period, 156 individuals (110 patients, 46 carers) were referred to SCCD, with 42 (38 patients, 4 carers) receiving direct psychiatric consultation. All referrals to the psychiatry clinic were associated with significant mental health symptoms as confirmed by IPOS data. Average duration of engagement in SCCD+PISCES was 18 weeks, and psychiatric reports were shared with treating teams, GPs, and relevant services following appointments to support ongoing care. Interventions frequently involved multidisciplinary support, including referrals to psychology, drug and alcohol services, community mental health, aged care, housing support, the National Disability Insurance Scheme (NDIS), and Aboriginal health teams.

Substantial reductions in unplanned health service utilisation (HSU) were observed. Emergency department (ED) presentations declined by 52% during the SCCD+PISCES program and were reduced to 39% of baseline at six months post-intervention. Unplanned hospital admissions dropped by 52% during the program and to 24% of baseline at follow-up. Hospital bed days decreased by 52% during the program and to 28% of baseline after six months. In contrast, patients receiving SCCD-only services showed improvements during the program—such as an 86% reduction in unplanned bed days—but these were not sustained following discharge.

Economic modelling revealed that while pre-intervention costs were comparable between groups, SCCD+PISCES patients achieved greater and sustained savings. Acute care-related costs decreased by $3,503 per patient during the program and by $12,412 in the following six months. SCCD-only patients experienced cost reductions of $8,687 per patient during the program, but these gains diminished post-discharge, equating to total projected savings of $252,842 (accounting for program delivery costs). Despite marginally higher delivery costs in SCCD+PISCES (+$4,575 per patient over the full period), the integration of psychiatric care resulted in clear net benefits of approximately $374,095, largely driven by reductions in unplanned bed days.

Following the pilot's success, the model was formally embedded as standard practice, named SCCD+. The expanded team includes a 0.2 FTE psychiatrist, a HETI-funded psychiatry registrar (0.2 FTE), SCCD social worker and occupational therapist. Care continues to be delivered through in-person, telephone, and virtual platforms, with standardised mental health screening applied to all new SCCD referrals. The integrated model ensures multidisciplinary and tailored responses to identified needs, with a strong focus on improving access for Aboriginal populations, rural communities, and those with complex psychosocial challenges.

Among the first 21 patients reaching six months post-discharge, HSU outcomes remained substantial. ED presentations reduced by 30% during SCCD+ (66 to 32) and remained 56% lower than baseline (29 presentations) at six months post-program. Admissions from ED reduced 34% during the program (35 to 16) and were down by 69% at follow-up (11 admissions). Unplanned hospital bed days dropped by 51% during SCCD+ (342 to 115) and were 75% below baseline (86 days) at six months post-discharge.

Cost savings remain consistent and accounting for program delivery costs, the total projected savings across the first 79 patients over two years reached $1.7 million. These estimates exclude potential savings related to carer outcomes, which are expected to be significant.

Beyond measurable reductions in health service use and cost, participants reported improved emotional wellbeing, reduced psychological burden, and increased resilience. The program proved particularly effective for individuals with complex needs, including those with severe mental illness, advanced liver disease, substance use disorders, neurodegenerative diseases, and for Aboriginal patients. The use of culturally responsive care was a key success factor.

SCCD+ is not a conventional referral-based psychiatry model. Instead, it integrates mental health expertise within existing chronic disease care structures. This includes co-located support, shared care planning, regular case conferencing, and sustained collaboration with local services. The program successfully addressed common barriers to mental health care such as stigma, geographic isolation, and mobility limitations through a hybrid delivery model.

The SCCD+ initiative highlights the value of systematic, validated screening in the identification and management of psychological distress in chronic disease populations. By embedding mental health care within chronic disease services and using data to guide triage and intervention, the model achieved significant improvements in consumer outcomes, health system performance, and cost-efficiency. These findings support the replication of integrated psychiatric care models within chronic disease frameworks across other health districts and systems.

REPORT

APPLICATION OF ACHS PRINCIPLES

1. Consumer Focus

The SCCD+ model was developed in response to clearly identified consumer needs for improved mental health support within chronic illness and palliative care. Patients and carers consistently reported high levels of psychological distress, with gaps in access to timely and specialised care.

> *"It's a very cold experience if you don't know and don't have the contacts. It's been terrible to get people to listen to me.... it was a black hole" (patient)*

Using validated patient- and carer- reported measures to guide decision making in SCCD+ ensures that consumers are central to care planning and delivery, with interventions that are individually tailored and culturally responsive. Further, strategic flexibility embedded in the design of SCCD+ allows care to not only be tailored to the expressed needs of consumers, but also towards disease-specific burdens which may vary across chronic disease states. Co-design elements, including feedback surveys and consumer testimonials, have helped shape improvements and validate the value of the model.

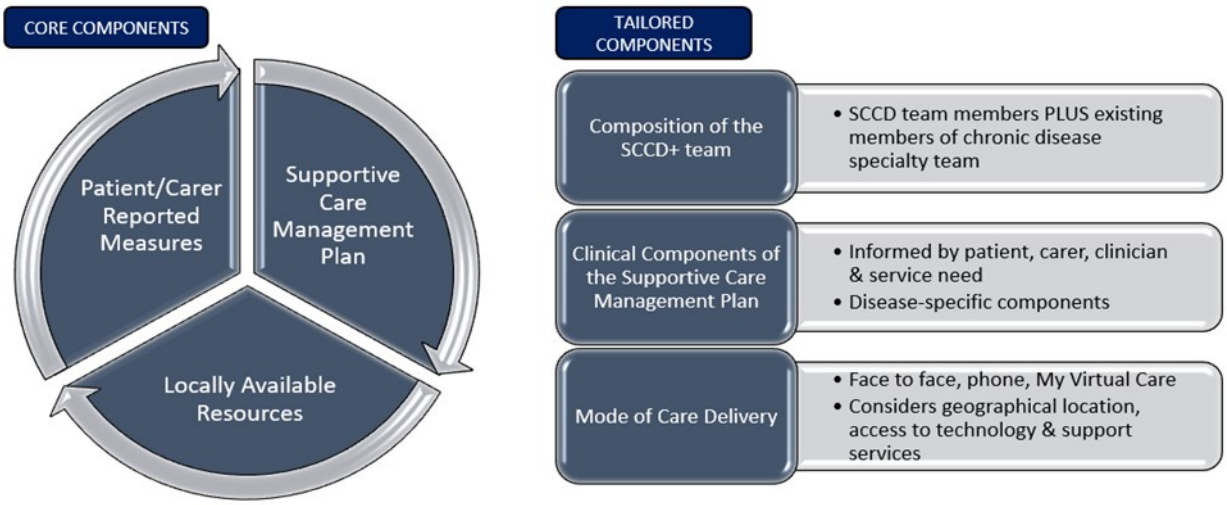


Figure 4. Core versus Tailored Components of the SCCD+ model of care

Flexibility in service delivery (via phone, in-person, and telehealth) ensures accessibility for patients with mobility issues and those living in rural and remote areas. Aboriginal patients and carers have benefitted from culturally safe engagement strategies developed in partnership with Aboriginal health teams.

2. Effective Leadership

The program is led through a formal collaboration between SCCD leadership and the Consultation-Liaison Psychiatry team at John Hunter Hospital (HNELHD), ensuring integrated governance and clinical oversight. Leadership is distributed and multidisciplinary, involving psychiatrists, SCCD clinicians, and chronic disease care teams. The program's strategic alignment with the Ministry of Health's Enhancing Community Care priorities and HNELHD objectives has secured long-term viability and workforce commitment. The successful application to HETI for a Psychiatry Fellowship further demonstrates forward-thinking leadership and commitment to workforce development.

3. Continuous Improvement

SCCD+ was established as a pilot and refined through continuous feedback, data analysis, and iterative learning cycles. The integration of psychiatric care has evolved based on evaluation findings, leading to improved referral pathways, shared care protocols, and expansion of services. Weekly case conferences, regular review of service utilisation data, and staff feedback mechanisms drive continuous improvement. A structured quality improvement framework underpins program delivery, with current developments focused on formalising carer programs and expanding clinical psychology access.

Experiential, transdisciplinary learning is central to continuous improvement within SCCD+ (Van Bewer, 2017). Through real-time collaboration, the existing transdisciplinary SCCD team developed a deeper understanding of psychological distress in patients with life-limiting chronic illness and gained practical skills to support its management. Knowledge transfer between psychiatry, palliative care, allied health, and chronic disease clinicians enabled each professional to develop a more complex, adaptable skill set, contributing to improved patient outcomes such as reduced distress and enhanced quality of care. This was further supported by psychiatrist-led peer supervision, which fostered reflective practice, increased clinician confidence, and progressively reduced the need for direct psychiatric support.

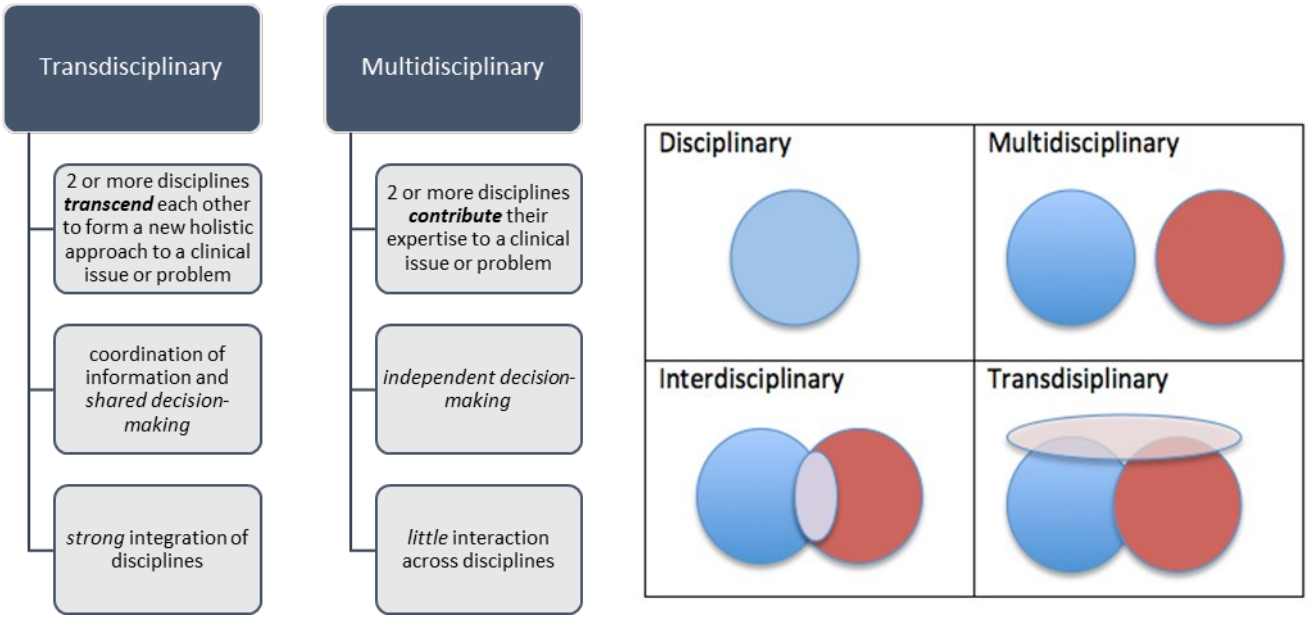


Figure 5. A different way of working: the transdisciplinary approach to care (Van Bewer, 2017)

Beyond the core SCCD+ team, cross-discipline learning extends to collaborations with external Mental Health and Chronic Disease Services. Joint meetings ensure all clinicians develop a shared, holistic understanding of patient and carers' needs. As patients transitioned back to standard care, mental health clinicians demonstrated increased confidence in managing chronic disease, while chronic disease teams became better equipped to address psychological distress, strengthening care delivery across the system.

4. Evidence of Outcomes

The SCCD+PISCES pilot delivered striking outcomes for patients and carers living with advanced chronic disease. The impact was clear. Unplanned health service use fell sharply for SCCD+PISCES patients, with ED presentations, unplanned admissions, and hospital bed days all reduced by more than 50% during the program and sustained at 6 months post-discharge (down to 28% of baseline for bed days). In contrast, improvements among SCCD-only patients were not maintained.

Table 2. SCCD+PISCES pilot data: impact on health service utilization for SCCD+PISCES patients versus SCCD-only patients

SCCD+PISCES patients	6 months pre SCCD (26 weeks) n=35	At SCCD completion (Average 18 weeks) n=35	6 months post SCCD completion (26 weeks) n=30
ED Presentations	106 (4.0/wk., 3.0/pt.)	56 (3.1/wk., 1.6/pt.)	42 (1.6/wk., 1.4/pt.)
Admissions from ED	63 (2.4/wk., 1.8/pt.)	33 (1.8/wk., 0.9/pt.)	15 (0.58/wk., 0.5/pt.)
Unplanned Bed Days	466 (17.9/wk., 13.3/pt.)	243 (13.5/wk., 6.9/pt.)	133 (5.1/wk., 4.4/pt.)
Same day/planned procedures	80 (3.0/wk., 2.3/pt.)	40 (2.2/wk., 1.1/pt.)	36 (1.4/wk., 1.2/pt.)
SCCD+PISCES OOS	133 (5.1/wk., 3.8/pt.) (triage and intake)	995 (55.3/wk., 28.4/pt.)	289 (11.1/wk., 9.6/pt.)
SCCD only patients	**6 months pre SCCD (26 weeks) n=21**	**At SCCD completion (Average 15 weeks) n=18**	**6 months post SCCD completion (26 weeks) n=16**
ED Presentations	66 (2.5/wk., 3.1/pt.)	19 (1.3/wk., 1.1/pt.)	16 (0.6/wk., 1/pt.)
Admissions from ED	38 (1.5/wk., 1.8/pt.)	7 (0.5/wk., 0.4/pt.)	14 (0.5/wk., 0.9/pt.)
Unplanned Bed Days	294 (11.3/wk., 14/pt.)	40 (2.7/wk., 2.2/pt.)	98 (3.8/wk., 6.1/pt.)
Same day/planned procedures	87 (3.3/wk., 4.1/pt.)	43 (2.9/wk., 2.4/pt.)	22 (0.8/wk., 1.4/pt.)
SCCD OOS	64 (2.5/wk., 3.0/pt.) (triage and intake)	313 (20.9/wk., 17.4/pt.)	61 (2.3/wk., 3.8/pt.)

Cost modelling demonstrated SCCD+PISCES achieved greater and more durable savings—generating a net benefit of ~$374,000 in the pilot and $1.7 million across the first 79 SCCD+ patients to follow—largely driven by reductions in hospital bed days. Critically, outcomes remain robust: patients continue to show reduced ED use, admissions, and bed days six months after program completion, confirming SCCD+ as a high-value, sustainable model of care. Figures 6 and 7 demonstrate these outcomes for the first 21 patients who have reached 6-months post discharge from SCCD+.

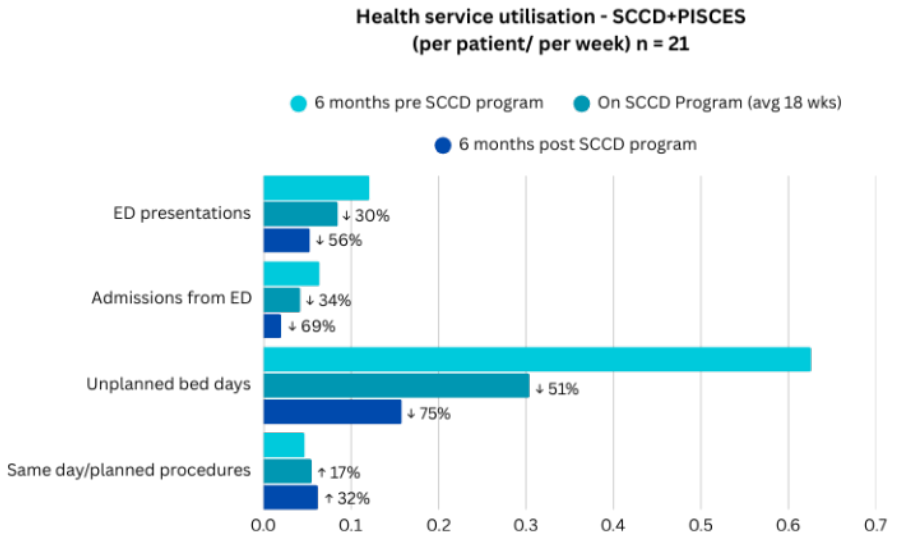


Figure 6. SCCD+ impact on health service utilisation following formal integration

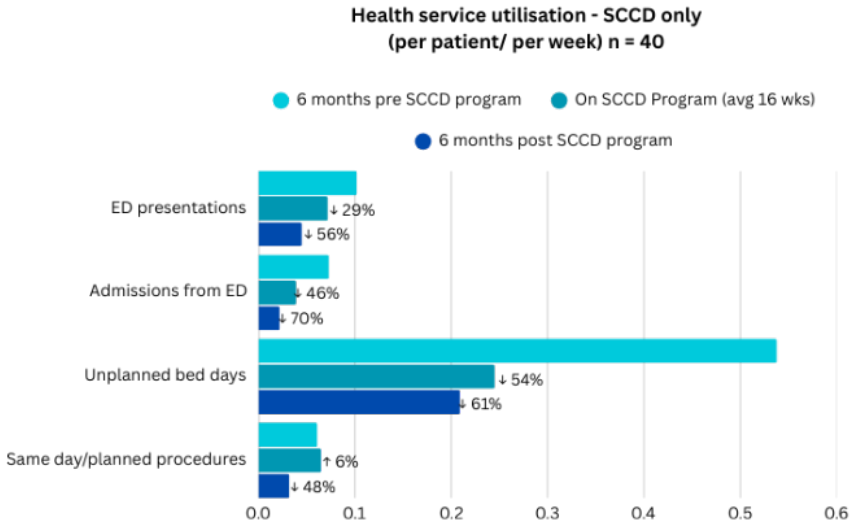


Figure 7. SCCD-only impact on health service utilisation following formal integration of SCCD+

Patient and carer-reported measures and participant feedback indicate improved mental health, emotional resilience, and satisfaction with care.

Table 3. SCCD+ patient and carer feedback

Quote	Source
Thank you for what you have done. You are amazing. I really appreciated what you have done.	*Patient*
I've got more outlook to just keep going, than before I started talking to you fellas.	*Patient*
When a person has multiple conditions, the team helped unpack these complexities and helped us move forward.	*Patient*
We felt heard…. We hope others get the same great outcomes as mum did.	*Carer*
Thank you for not only supporting me but also providing quality supports to my family.	*Patient*
Worked well – holistic approach – looking at not just my disability but all of me.	*Patient*
It's been so nice to have a sounding board. You have been a big strength behind my life, and I have tears in my eyes as I don't want to see you go. I really appreciate you guys.	*Carer*
I am very grateful for their insight, support, and direction.	*Patient*
Being able to talk freely with you guys was so helpful.	*Patient*

5. Striving for Best Practice

SCCD+ is built on best-practice principles in palliative care, mental health, and chronic disease management. It goes beyond traditional referral models by embedding psychiatry within a transdisciplinary team, promoting timely, holistic interventions. Flexible, patient-centred delivery ensures accessibility and equity. The model includes workforce mentoring, professional education, and capability building across the district. Lessons learned through SCCD+ are already informing broader chronic care planning and workforce training strategies. Currently, SCCD+ partners with liver, heart failure, Parkinson's disease, motor neurone disease, cardiopulmonary rehabilitation, and complex care for Aboriginal people services across HNELHD. Positive experiences and outcomes in these areas have led to heightened interest from broad clinical groups and additional working partnerships are currently in development with respiratory and neurodegenerative services across the district.

Patients referred to the SCCD+ program have significantly higher self-reported disease-related burden and rely heavily on acute care services to address these needs. Despite this higher need, SCCD+ demonstrates substantial improvements in productivity, efficiency, and cost-effectiveness.

- **Unplanned Health Service Utilisation Reductions:** For the first 21 patients reviewed six months post-discharge from SCCD+, reductions in health service use were both marked and sustained. ED presentations fell 30% during SCCD+ (66 to 32) and remained 56% below baseline at follow-up (29). Admissions from ED dropped 34% during the program (35 to 16) and were 69% lower at six months (11). Unplanned hospital bed days showed the greatest gains, reducing by 51% during SCCD+ (342 to 115) and plunging to 75% below baseline (86) at six months post-discharge.
- **Cost Savings:** SCCD+PISCES pilot delivered greater and more durable savings than SCCD alone, with acute care costs reduced by $3,503 per patient during the program and a further $12,412 in the following six months, driving a net benefit of $374,095 despite slightly higher delivery costs. Following formal adaptation, savings have remained consistent, with projected total savings of $1.7 million across the first 79 patients over two years, excluding additional expected gains from improved carer outcomes.
- **Sustainability of Investment:** The program uses a flexible delivery model—virtual, phone, and in-person—tailored to patient needs while maintaining a low-cost structure. This adaptability supports implementation across diverse settings without significant additional infrastructure or workforce demands.
- **Workforce Efficiency:** Embedding psychiatry within the existing SCCD framework enables more efficient use of the existing multidisciplinary workforce. Psychiatric care becomes part of routine practice, improving coordination and ensuring holistic care planning.

Overall, SCCD+ delivers clear value for money by improving patient outcomes, reducing avoidable hospital use, and optimising workforce and system efficiency. Its scalable, sustainable design makes it an effective model for addressing the complex needs of patients with chronic disease and comorbid mental health conditions.

INNOVATION IN PRACTICE AND PROCESS

The SCCD+ model demonstrates a highly original and innovative approach to addressing a well-documented but largely unmet need: the mental health care of patients with advanced non-malignant chronic illness.

While integrated psychiatry is a known concept in acute and cancer care, SCCD+ is one of the first programs in Australia to embed psychiatric expertise within a supportive care model tailored specifically to chronic disease populations. This represents a significant service innovation in both setting and scope.

SCCD+ departs from traditional, siloed psychiatric care by embedding a Consultation-Liaison Psychiatrist and Registrar within the transdisciplinary SCCD team. This integration fosters real-time collaboration, enabling psychiatric input into care planning and capacity building among chronic disease and palliative care clinicians. Unlike standard referral-based models, SCCD+ operates with shared care responsibility, allowing for more nuanced, timely, and person-centred interventions.

The service also pioneers a flexible mode of delivery—combining in-person, phone, and virtual consultations—specifically designed to reach patients and carers in rural and remote areas of Hunter New England. This enhances equity of access and overcomes geographic barriers that typically limit specialist mental health support in regional areas.

Innovation is also reflected in the structure of workforce development and mentoring. A key success has been the integration of a psychiatrist-led education framework, including peer supervision, case conferencing, and informal mentoring. This supports knowledge transfer across disciplines and builds capability within both the SCCD service and broader chronic disease workforce. The successful establishment of a HETI-funded psychiatry registrar position in palliative care adds further value, serving as a pilot for future specialist training pathways.

Innovation is further demonstrated through the program's data-driven sustainability model. Health service utilisation data were rigorously analysed to measure outcomes and predict cost savings, supporting strategic

planning and long-term resourcing. Predicted and actual cost savings provide compelling evidence of value, reinforcing the program's viability and scalability.

In summary, SCCD+ is not merely an adaptation of a known model—it is a bold reimagining of integrated mental health care within chronic disease management. It combines clinical excellence, technological flexibility, and economic sustainability to respond creatively and effectively to a persistent gap in care.

APPLICABILITY TO OTHER SETTINGS

SCCD+ is an evidence-informed model with high potential for replication across settings and populations. Designed to address complex mental health needs among patients with advanced chronic disease, it is already accessible to diverse cohorts (e.g. heart, liver, neurological, respiratory conditions, and Aboriginal communities). Its flexible delivery mode facilitates a seamless rollout in rural, regional, and metropolitan services without need for additional resourcing. The model integrates with existing chronic care programs, making it adaptable to other Local Health Districts and health systems.

One of the key strengths of SCCD+ is its use of existing workforce and infrastructure. The model operates without requiring new clinical systems, instead embedding psychiatry within current chronic disease and supportive care teams. This structure enables rapid replication in services that already support people with advanced chronic illness, including palliative care, aged care, and community-based chronic disease programs.

Significant reductions in unplanned HSU and associated cost savings demonstrate strong return on investment and provide compelling evidence for scale. SCCD+ is already being used to inform models of care in other specialties within HNELHD. In parallel, the program is informing new psychiatry workforce training pathways, with the HETI-funded fellowship pilot currently underway and positioned for expansion.

The model's virtual and hybrid modes of delivery make it highly suitable for regional, remote, and hard-to-reach populations. It addresses the systemic equity issues faced by patients and carers with limited access to mental health care. As such, it offers a blueprint for statewide initiatives aimed at improving mental health care in chronic illness across diverse settings.

Its scalability is already underway locally (respiratory and neurodegenerative specialty groups across HNELHD) and the model is being considered for integration across other LHDs (South Western Sydney LHD). With its demonstrated clinical and financial benefits, SCCD+ is well-positioned for broader implementation across New South Wales and beyond, offering a robust framework for sustainable, integrated mental health support in chronic disease care.

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APPENDIX

Appendix 1

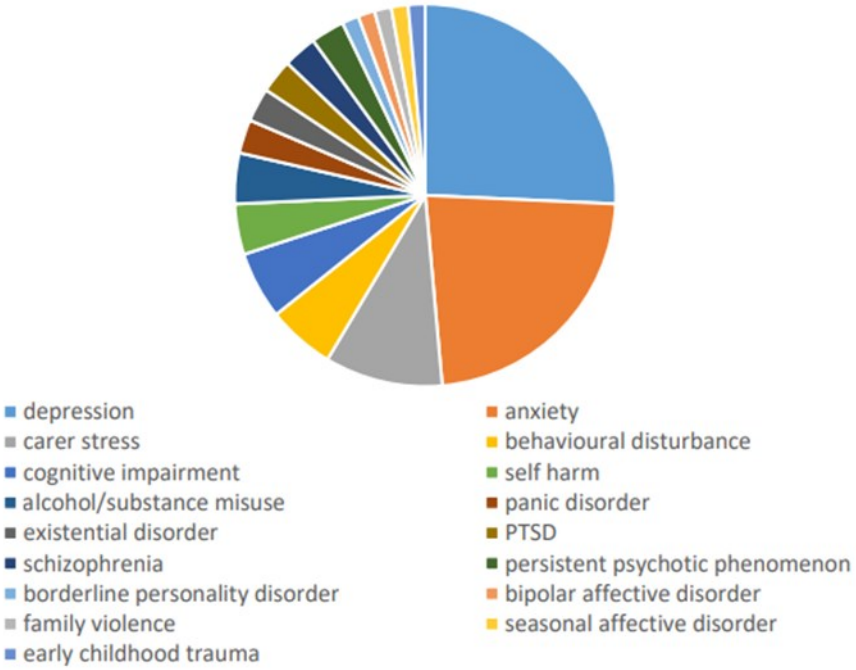

Figure 1. Prevalence of pre-existing (self-reported) patient and carer mental health issues and/or psychiatric illness (SCCD+PISCES participants)

Table 1. Supportive Care for Chronic Disease: schedule of measures

Patient or Carer-Reported Measure	Baseline (Visit 1)	Week 4 (Visit 2)	Week 6 (Visit 3)	Week 8 (Visit 4)	Week 12 (Visit 5)
Integrated Palliative Outcomes Scale (IPOS)	X	X		X	X
EuroQol (EQ-5D-5L)	X	X		X	X
Malnutrition Screening Tool (MST)	X				X
EAT-10	X				X
Carer Experience Scale (CES)	X		X		X
Carer Support Needs Assessment Tool (CSNAT)	X		X		X

Appendix 2

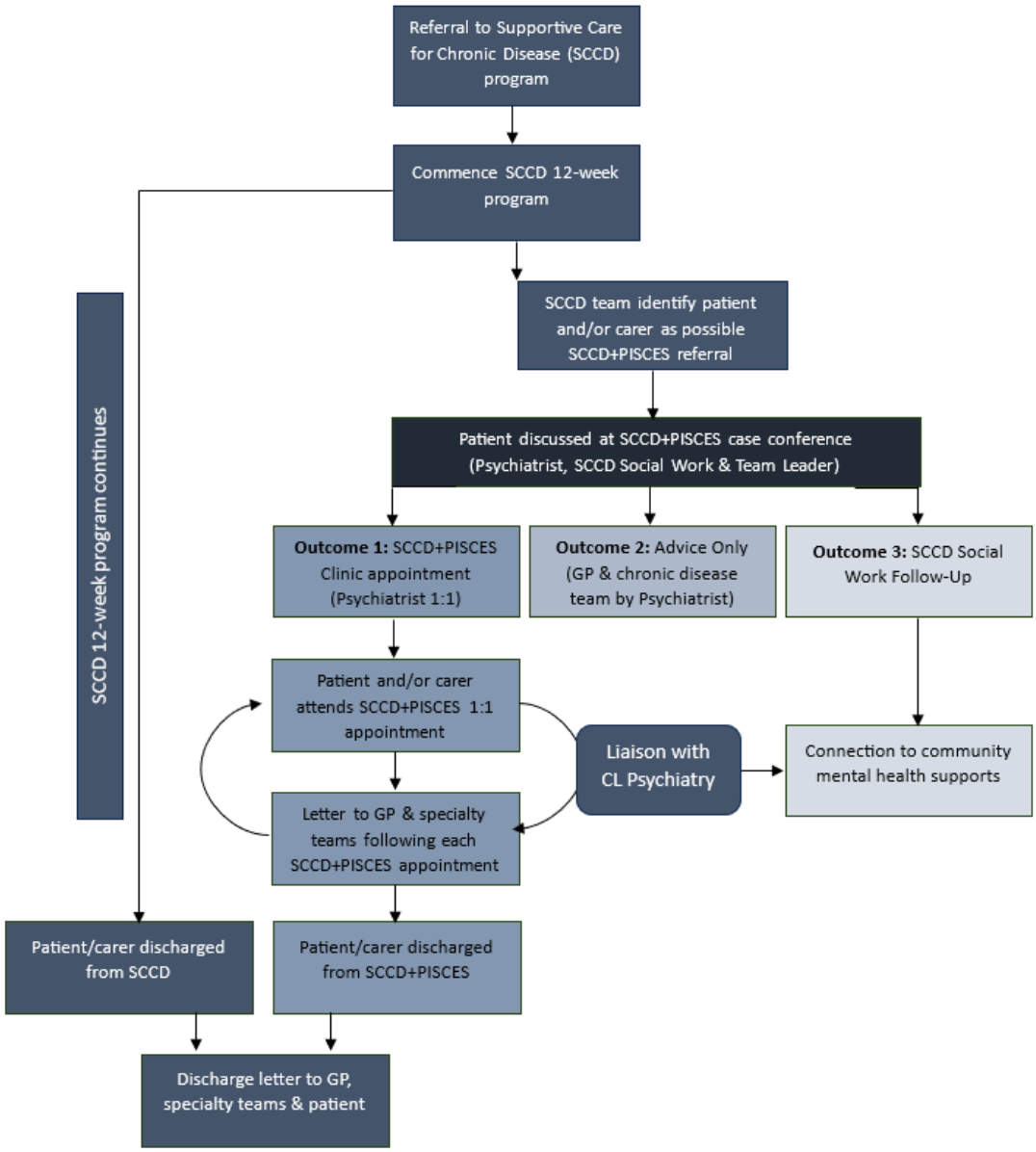

Figure 2. The SCCD+PISCES Model of Care

Table 2. SCCD+PISCES Referral Criteria

Referral Source	**Criteria for Referral to SCCD+PISCES**
Identified by SCCD clinicians during standard consultations	Person (patient or carer) at risk of mental health deterioration
Referral Criteria may include:	
Integrated Palliative Outcomes Scale (IPOS)	Items 3 to 8 scored >3
EQ-5D-5L	Pain/discomfort and/or anxiety/depression items scored >4
Carer Experience Survey (CES)	Any item score = 3
Psychiatric History	Pre-existing diagnosis of severe psychiatric disorder (e.g., schizophrenia)
Health/Functional Decline	Significant deterioration with unmet support needs from current care providers
Prognosis	Significant change in prognosis

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Healthy Beginnings for HNE Kids: from pilot to HNE-wide scale-up

A/Prof Rachel Sutherland, Prof Luke Wolfenden, Nayerra Hudson, Dr Alison Brown, Dr Jacklyn Jackson, Jessica Pinfold, Christophe Lecathelinais, Dr Paul Craven, Sinead Redman, Susan Darby, Tauri Smart, and Fiona Murphy

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Mind & Matter: psychiatry in chronic disease

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