



QUALITY INITIATIVES
THE 22ND ANNUAL
ACHS QUALITY
IMPROVEMENT
AWARDS 2019



Quality Initiatives – Entries in the 22nd Annual ACHS Quality Improvement Awards 2019.

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INTRODUCTION

The 22nd Annual ACHS Quality Improvement Awards 2019

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 2019, the 22nd 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, EQulP6 (Evaluation and Quality Improvement Program), Standards Program, EQulP6 Day Procedure Centres, EQulP6 Oral Health Services, EQulP6 Haemodialysis Centres, EQulP6 Aged Care Services, EQulP6 Healthcare Support Services, and the ACHS Clinical Indicator Program.

Judging was conducted externally with separate panels of three 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.

Non-Clinical Service Delivery: This category acknowledges a demonstrated outcome of improvement and innovation in patient and/or consumer services and organisation-wide practice including services provided by community and allied health organisations.

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).

Global Quality Improvement Award: This category is new to the ACHS Quality Improvement Awards in 2019. The Global Quality Improvement Award recognises organisations that are using Australian healthcare standards to strengthen quality improvement frameworks internationally. ACHS has recognised the implementation of Australian healthcare standards internationally for many years, previously awarding Highly Commended Certificates.

The Global Quality Improvement Award is selected from all of the Submissions received by ACHS.

Each judging panel consisted of an ACHS Councillor, an ACHS surveyor 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 extended version of this document will be published on the ACHS website (www.achs.org.au).



WINNER SUBMISSIONS BY CATEGORY

The 22nd Annual ACHS Quality Improvement Awards 2019

CLINICAL EXCELLENCE AND PATIENT SAFETY

Calvary Public Hospital Bruce, in Partnership with Capital Health Network, ACT

Innovation and Redesign Unit

Trialing a Geriatric Rapid Acute Care Service in the ACT

Dr John Merchant

Full submission page 6

NON-CLINICAL SERVICE DELIVERY

Royal Prince Alfred Hospital, in Partnership with Chris O'Brien Lifehouse Medical Physics Team, NSW

Biomedical Engineering Department

Collaboration and Development of an Innovative Total Body Irradiation (TBI) Bed for the Best Patient Care

Cindy Wang (lead author), Luke Khoo (lead project), Vince Reynolds, Chin Voon, May Whitaker (co-lead project), Robin Hill, Dane Pope

Full submission page 27

HEALTHCARE MEASUREMENT

Royal North Shore Hospital, NSW

Intensive Care Unit

Reducing Inappropriate Arterial Blood Gas Testing in a Quaternary Intensive Care Unit

Dr Oliver Walsh, Katelyn Davis, Dr Jonathan Gatward

Full submission page 39

GLOBAL QUALITY IMPROVEMENT

National Critical Care and Trauma Response Centre, NT

Clinical Governance Group

Establishing a New National and International Benchmark – A Unique Application of the ACHS EQuIP6 Quality Improvement Framework to Australia's National and International Deployable Health Emergency Capability

Dr Dianne Stephens, Jane Thomas

Full submission page 20



HIGHLY COMMENDED SUBMISSIONS BY CATEGORY

The 22nd Annual ACHS Quality Improvement Awards 2019

CLINICAL EXCELLENCE AND PATIENT SAFETY

Royal Women's Hospital - Melbourne, VIC

Quality and Safety

Assessment and Care of the Jaundiced Newborn at Home

Carolyn Looney

Summary Abstract page 15

Karitane, NSW

Karitane Toddler Clinic

Internet-Parent Child Interaction Therapy: Improving access to specialised parent training programs for families from rural and remote areas of New South Wales

Jane Kohlhoff

Summary Abstract page 16

WA Country Health Service, WA

Southwest Hospital sites and Population Health

Care of the Vulnerable Child

Sharlene Abbott, Caroline Vernon, Julie Matters, Katina Jones, Ann Lefroy, Donna Guthridge and Marie O'Donoghue

Summary Abstract page 18

NON-CLINICAL SERVICE DELIVERY

Royal Perth Bentley Group, WA

Emergency Department

Volunteer Concierge Project in the Emergency Department

Sarah-Louise Moyes, Julie Knuckey, Hayley Makuch, Simon Elliott, Sara Lavis

Summary Abstract page 35

Royal Perth Bentley Group, WA

Centre for Wellbeing and Sustainable Practice/Postgraduate Medical Education

Well, Well, Well – A good state of being

Richard Read, Micahel Hertz, Nicola Frew, Lucy Kilshaw

Summary Abstract page 36

HEALTHCARE MEASUREMENT

Hunter New England Local Health District, NSW

Clinical Governance

Empowering patients, family, and carers for improved recognition and response to clinical deterioration

Daniel McCarthy, Mary Bond

Summary Abstract page 54

Central Coast Local Health District, NSW

Neurosciences

Impact of a digitally enabled stroke service on KPIs and best practice metrics

Bill O'Brien, James Evans, Khaled Alanti, Lauren Wheeler

Summary Abstract page 56



CLINICAL EXCELLENCE AND PATIENT SAFETY

WINNER

Calvary Public Hospital Bruce, in Partnership with Capital Health Network

Innovation and Redesign Unit

Trialing a Geriatric Rapid Acute Care Service in the ACT

Dr John Merchant

AIM

To establish a consumer focussed Residential Aged Care Facility (RACF) Outreach Service based at Calvary Public Hospital Bruce (CPHB), to act as a liaison between acutely unwell residents, their relatives and/or carers, identified facilitates, Local Medical Officers (LMOs), Emergency Department (ED) staff and ACT Ambulance Service (ACTAS), for improved care delivery.

15% reduction in ED Short Stay Unit (SSU) ALOS and an 8% reduction in ALOS for other ward admissions when compared to baseline. An independent qualitative review and ad hoc feedback showed high levels of consumer, carer and staff satisfaction and experience. Post-trial the ACT Government has provided recurrent funding to allow for a phased Service expansion over the next two financial years to all ACT RACFs.

SUMMARY ABSTRACT

The Geriatric Rapid Acute Care Evaluation (GRACE) Service is an outreach service providing enhanced integrated care to acutely unwell aged care facility residents. The model originated at the Hornsby Kur-ing-gai Hospital and Calvary Public Hospital Bruce (CPHB) was selected by the Capital Health Network (CHN) through tender to trial a like service fit for local purpose. The trial was jointly governed and resourced, overseen by a Project Board with consumer representation, integrated into existing safety and quality systems within CPHB, conducted over the period August 2017 to March 2019, and serviced five north side residential aged care facilities (RACFs). The locally developed model of care (MoC) included a telephone support service for facility staff, on-sight assessment and care provision, case management within the ED and ward stay, and post-discharge care if required. A needs based education program was also provided by GRACE staff, with content being identified by local facility staff. Medical governance remained with the attending Local Medical Officer (LMO) for community based care, and the Admitting Consultant for inpatient care, including Hospital in The Home (HiTH) management. Results showed a 22% decrease in ED transfers, a 21% reduction in admissions, a

REPORT

APPLICATION OF ACHS PRINCIPLES

1. Consumer Focus

The GRACE trial was borne out of a gap analysis of services undertaken by the CHN which identified avoidable ED attendances and hospital admissions of older people as a priority area in improving care options and experience for this often overlooked group of health care consumers.

The aim of the trial translated into a number of high level consumer focussed trial objectives which included:

1. Collaboration with consumers and health care stakeholders to develop a MoC that provided:
 - a. A decision making support system for service activation (see Appendix 1),
 - b. streamlined communication with, and access to hospital based services,
 - c. coordinated consumer management plan development in consultation with all stakeholders,
 - d. continuing care support and advocacy over the acute illness phase, and
 - e. an education and skill development program to be informed by local care providers (see Appendix 2).

2. Through the MoC promote support of acutely unwell residents as close to their place of residence as possible, and
3. Enhance the flow and coordination of care for acutely unwell residents who are transferred to the acute system, and continue care as close to their place of residence as possible.

The resultant model consisted of four main service arms. These involved providing:

1. An advice / support / education resource to RACF staff,
2. Acute assessment and clinical support to acutely unwell RACF residents at their place of residence,
3. Case management and advocacy for RACF residents within the ED, with post-discharge support, and
4. Case management and advocacy for RACF residents admitted to hospital, with post-discharge support.

The high level Key Performance Indicators (KPIs) endorsed by the PB as trial outcome measures were consumer focussed and chosen to assess the extent to which the identified service gap and care options had been addressed and the ability to sustain the service into the future. The KPIs included the following qualitative and quantitative measures:

1. A qualitative review of consumer and staff experience and satisfaction,
2. Decreased transfers to the CPHB ED from participating RACFs,
3. Reduced acute inpatient admissions from participating RACFs,
4. Decreased ALOS where admission was unavoidable, and
5. An evaluation of the financial sustainability of the Service going forward.

As part of the communication plan, an information brochure was developed outlining the GRACE Service to provide information to consumers, their family and friends. The brochure was developed with strong consumer representation, working together with the CPHB communications officer and Service staff (see Appendix 3).

2. Effective Leadership

Governance

The trial was overseen by a joint governance framework which include both CPHB and the CHN. The trial was conducted according to a Service Agreement (SA) which outlined the key deliverables and timelines.

The PB was established and comprised of representatives from CHN, CPHB, Health Care Consumers ACT, a clinical manager from a participating RACF, ACTAS and LMOs providing care in the trial sites. The CPHB representatives included staff from the ED, general wards, Patient Flow Unit (PFU), Hospital in The Home (HiTH), GP Liaison Unit, and geriatrician services.

Nursing governance was provided via the existing CPHB structure for the division of medical services. Medical governance for non-admitted trial participants remained with the LMO, and with inpatient teams for admitted trial participants.

All other aspects of the trial's clinical and corporate governance were incorporated into CPHB base operational systems

The PB provided oversight and endorsement of foundational documents including:

1. PB Terms of Reference (ToR),
2. Project initiation,
3. Project scope,
4. MoC,
5. Reporting plan,
6. Risk register, and
7. Communications plan.

Overarching Methodology

The trial was conducted according to Prince2 project methodology.

Ethics

Approval by the CPHB Human Research Ethics Committee (HREC) was sought and provided prior to Service implementation.

Trial site selection

Trial RACF sites were identified through review of ED referral patterns within the CPHB catchment area. Those facilities with the five highest referral activity were approached to participate in the trial. All five facilities agreed to be foundational trial sites, with services commencing 3 October 2017. A further site was added 29 October 2018 in line with staff recruitment and increased service delivery capacity.

For acutely unwell residents who were referred to the ED, and/or admitted from RACFs outside the trial cohort, the GRACE team provided the same level of service to ensure consistency of care to all RACF residents accessing acute system services. It was a priority of the trial team to ensure all consumers entering the acute care system had equal access to the GRACE Service.

Data System and Capture

Demographics, Geographics & Activity

The CPHB Patient Administration System (ACTPAS), and the Emergency Department Information System (EDIS), were used to capture patient and service activity data associated with participating RACFs.

The data associated with the RACF site which entered in the later stages of the trial has been excluded from the data cohort to maintain comparative consistency with the base dataset. The in-hospital service activity provided to patients referred from RACFs outside the trial cohort has also been excluded from the data cohort in-line with the PB endorsed methodology to assess trial outcomes.

Quality & Safety

The CPHB Riskman system was used to track quality and safety data. Existing clinical governance mechanisms were used to manage any related incidents and issues, compliments and complaints. The risk register was reviewed by the PB at regular intervals.

Sustainability

The trial Occasions of Service (OOS) were mapped according to Activity Based Funding (ABF) principles and methodology. Existing CPHB ABF systems were used to convert activity to National Weighted Activity Units (NWAUs). This information was used to determine predicted revenue using the relevant efficient price. Trial costs were tracked according to a project specific Cost Centre set up within existing CPHB financial systems.

ACTPAS and EDIS data was used to assess opportunistic system benefits including impact on ambulance transfers, ED capacity and occupied bed days.

Recruitment

A recruitment process resulted in the appointment of two senior registered nurses as the GRACE Service team, combining a broad skill base which included critical care, ambulatory care, patient flow, hospital administration and clinical research. The GRACE team were significantly involved in the project from pre-mobilisation, developing the foundational documents and implementing the communications plan with multiple face to face meetings with RACF managers and staff and LMOs.

3. Continuous Improvement

The original MoC performed well against the endorsed performance, quality and safety indicators and was reviewed and adjusted during periods of both planned and unplanned review by the PB. These changes were in

response to active learning throughout the trial and included alterations to the activation pathway, particularly as it related to the inability of RACF staff to contact the LMO at times, changes to afterhours medical support, and the interface between acute and continuing nursing care.

There were a number of issues and key learnings which arose during the trial which lead to continuous improvement to the Service. They were tracked by the trial risk register and problem solved at PB meetings. These are listed below.

- The transfer of information was made challenging by the complex and differing systems used throughout the RACFs, LMO settings and CPHB. A template document outlining the care plan and care provided was devised by the Service and integrated into the facility information systems. My Health Record may offer a solution to this issue in the medium term.
- Communication and documentation processes were reviewed throughout the trial to ensure timely, accurate and complete transfer of information between all stakeholders involved in the care of the patient, ensuring the care plan and its progress was relayed to all stakeholders.
- After-hours medical cover, particularly requests for input into care decisions by the patient's LMO, highlighted the unrealistic expectation of LMOs always being available to support care. This issue was also recognised in the independent review forming the basis of a recommendation. As a result of this trial outcome, funding for a dedicated GRACE geriatrician was requested and approved in the recurrent business case, with a 0.5FTE geriatrician having been appointed to the GRACE team. There is planned incremental increases in this FTE aligned to the phased expansion of the Service. This staff member is available to provide support to the Service team along with HiTH consultants on a rostered basis.
- Early in the trial there was recognition of the high degree of intersection in the delivery of GRACE and palliative care services. There were several meetings between GRACE and Home Based Palliative Care (HBPC) staff to address this issue. Improved communication and referral practices were established between the two services. GRACE trial staff were also required to attend the Program of Experience in the Palliative Approach (PEPA) workshop. This

continues to be a pre-requisite for all GRACE staff.

- Certain policies exist within the RACF sector which mandate transfer of patients to the ED for assessment in particular circumstances. In some instances the GRACE Service is able to substitute for that requirement, with ongoing support and education aiming to expedite review of these policies.
- There was a high burden of data entry on clinical staff, with a need to record retrospectively on return to CPHB. Enabling IT solutions as well as administrative support was requested and approved in the recurrent funding business case.
- Confidence in the skills of the GRACE staff by all stakeholders was considered paramount to the success of the trial and ongoing acceptance and sustainment of the Service.
- The ability of GRACE staff to assess acutely unwell patients in the community setting and communicate their findings to multiple stakeholders, and do so confidently, was considered a key driver of the success of the trial.

4. Evidence of Outcomes

Demographics

The age range of patients accessing the Service was 57-102 years with a median age of 79.5 years. More females than males were referred to the service, representing 63% versus 37% of referrals respectively (see Table 1).

Table 1: GRACE Patients and Activity 1 October 2016 – 31 January 2019

GRACE Age and Occasions of Service				
	No. of patients	Age Range	Median Age	OOS
GRACE RACFs				
Female	235 (63%)	57-102	79.5	1710 (63%)
Male	141 (37%)	65-98	81.5	995 (37%)
GRACE Total	377	57-102	79.5	2705

Geographics

The five trial sites represented a cohort of 473 residential aged care beds. All RACFs were in the CPHB catchment (see Table 2).

Table 2: Participating facility Bed Profile vs Referral Activity

Facility Settings vs Patients Referred				
Participating RACF	Number of Settings (beds)	% of Trial Settings (beds)	Number of Patients Referred	% of Overall Referrals
A	137	29%	117	31%
B	100	21%	75	20%
C	53	11%	53	14%
D	100	21%	77	20%
E	83	18%	55	15%
Totals	473	100%	377	100%

Activity

Over the trial period the Service was referred 377 patients resulting in 2705 OOS. This represented an average of 24 referrals per month, and an average of 7.2 OOS per referral (see Table 3).

Table 3: Occasions of Service

Occasions of Service				
	OOS	Patients	Average OOS per Patient	Average referrals per Month
Participating RACFs	2705	377	7.2	24

The overall service activation rate, when expressed in OOS delivered per RACF bed per annum, was 4.3. When separated into care delivery settings for place of residence, ED and ward, the service activation rates were 3, 0.3 and 1 respectively.

The majority of service activity occurred within trial RACFs, with 70% (1883) of OOS taking place at the patient's place of residence. Seven percent (180) of OOS occurred within the ED, with the remaining 23% (642) in the ward setting.

Overall the average length of an OOS was 29 minutes. The average length of an OOS delivered at the patient's residence, ED and ward setting was 31, 28 and 22 minutes respectively (see Table 4).

Table 4: Location and Duration of Service Delivery

Location and Duration of Service Activity			
Service Location	Number of Contacts	Total Minutes	Average minutes
Participating RACF	1883 (70%)	58,147 (75%)	31
Emergency Department	180 (7%)	4,989 (7%)	28
Ward	642 (23%)	14,106 (18%)	22
Total	2705	77,242	29

For the period of the trial there was a 22% decrease in ED presentations, and a 21% decrease in admissions to a ward for residents from participating RACFs when compared to the baseline period.

The average length of stay (ALOS) for admissions to the ED Short Stay Unit (SSU) for patients presenting from participating RACFs decreased by 15%, from 9.9 hours to 8.4 hours, compared to the baseline. The ALOS for ward admissions decreased by eight percent, from 5.94 days to 5.45 days, compared to the baseline (see Table 5).

Table 5: Key Performance Indicator Summary

Baseline and GRACE Comparison				
	Pre GRACE Oct15-Jan17	GRACE Trial Oct17-Jan19	Variance	%Variance
ED presentations	1206	939	-267.00	-22%
Admissions to acute ward	830	654	-176.00	-21%
Average LOS SSU (hours)	9.89	8.36	-1.53	-15%
Average LOS in acute ward excluding SSU (hours)	5.94	5.45	-0.49	-8%
Ambulance transfers	810	691	-119.00	-15%

Quality, Safety and Independent Qualitative Review

Data

There were five incidents captured in Riskman relating to patients involved in the trial. All incidents were rated Severity Assessment Code (SAC) 3, the second lowest rating available. None of the incidents related directly to the Service or trial staff.

There were six in-hospital deaths for patients who were participants in the trial. All were expected, with none being referred to the coroner's office.

There were four Medical Emergency Team (MET) activations for patients who were admitted from participating RACFs, three being for general deterioration and one following a fall. The MET activation rate for patients involved in the trial was 2.12 per 1,000 Occupied Bed Days (OBDs) compared to a rate of 4.51 per 1,000 OBDs for CPHB overall.

There were no readmissions to hospital within 28 days for patients admitted from participating RACFs.

Complaints and Compliments

There were two complaints received relating to the Service for the trial period. One was notified directly through CPHB complaint systems, the other via a third party. Both were investigated according to CPHB custom and practice, with investigation outcomes reported to the PB to the extent that privacy and process compliance permitted.

Multiple compliments were received for the Service during the trial, via both verbal and written communication, from a wide range of stakeholders. General themes related to improved communication, standard of care, and the ability to receive care at the place of residence.

Independent Review

An independent review of the Service was commissioned by the CHN September 2018 to evaluate the MoC from a qualitative perspective. While the report remains commercial in confidence there was a general finding that all stakeholders felt that the objectives of the trial had been met through the MoC implementation to date and related a high degree of satisfaction and positive experience.

Sustainability

Modelling showed the Service could be partially funded under an ABF model. The trial staffing costs, according to the trial MoC, were shown to be sustainable under an ABF model, however

corporate overheads and support staffing costs would not be met by the projected revenue.

System benefits such as reduced ambulance transfers, decreased ED referrals and decreased ALOS were modelled to show a return of approximately \$712,350 to the system, according to the scope of this trial. In reality this benefit is realised as returned capacity to the system, with the care moved to the community setting provided at lower cost.

During February 2019 the ACT Government allocated \$9.6m to be spent over four years to sustain and expand the Service to be available to all RACFs in the ACT.

5. Striving for Best Practice

The trial team visited the Hornsby Kur-ring-gai Hospital to observe and learn from the founding GRACE Service team. The team was generous in sharing their experiences, learnings, documents and service reports. The team remained available for continuing advice and comment throughout the ACT trial (see reference 1).

The trial team also researched other examples of acute system based outreach services providing enhanced care to RACF residents. The St Vincent's Hospital in Melbourne was found to operate a Residential Aged Care In-Reach (RIR) service from the hospital's emergency department (see reference 2). The trial team was able to visit the service team and built a strong relationship with the RIR service manager, who provided copies of base documents and continuing advice throughout the trial.

Other services were identified and researched as part of the trial pre-mobilisation including the Aged Care Emergency Model trial at Gosford Hospital (see reference 3).

Involvement of the ACT Ambulance Service through membership of the PB along with the development of the MoC enabled transfer of learnings from the enhanced paramedic care and intervention trials previously conducted by the service. This local knowledge was valuable in describing the types of care issues the trial team would likely be involved in at the trial sites.

Throughout the trial the team continued to monitor medical literature for intercurrent reports on like services and outcomes of trials involving outreach care to RACF residents (see reference 4).

The CPHB safety and quality systems were used to monitor the trial. Any issues identified were added to the risk register and discussed at the PB meetings. Care models and service provision

were altered as required to improve the patient and service stakeholder user experience.

INNOVATION IN PRACTICE AND PROCESS

The GRACE Service represented innovation in the ACT context by offering a previously unavailable care option for acutely unwell RACF residents. While the Service was modelled on previous like services, the model of care developed was specific to the local needs, and included an in-hospital arm for continued patient advocacy, compliance with the agreed to and patient preferred care plan, and proactive discharge should it be safe to do so. This allowed for an increased level of confidence in the Service by the in-hospital care providers through improved relationships with the Service team, which allowed for earlier discharge.

Unique partnerships were formed through the trial across the acute and community care systems through the joint governance structure and wide stakeholder involvement in the PB. Acute service providers became more aware of the baseline RACF care setting with the reverse also being true. The LMOs in the trial, once familiar with the Service and the skill set of the team, were strong advocates for the use of the Service and the improved care offering to their patients.

REFERENCES

1. Yazdani Y (2012), Geriatric Rapid Acute Care Evaluation, 'Bridging the gap between Acute and Residential Aged Care'.
2. Larkins A et al (2009), Residential Aged Care In-Reach Clinical Support Pilot Program Evaluation.
3. Wenham C (2013), Aged Care Emergency Model Evaluation, Gosford Hospital, Central Coast Local Health District.
4. Arendts G et al (2018), A clinical trial of nurse practitioner care in residential aged care facilities. *Archive of Gerontology and Geriatrics*, 77 (2018) 129-132.

Where crossover services were identified, such as with palliative care, processes were innovated for and redefined to allow for early care transfer to the most appropriate care provider, resulting in improved care and experience for the consumer.

APPLICABILITY TO OTHER SETTINGS

As a result of the trial, the ACT Government has provided recurrent funding for a phased expansion of the Service to include all RACFs in the jurisdiction within two years.

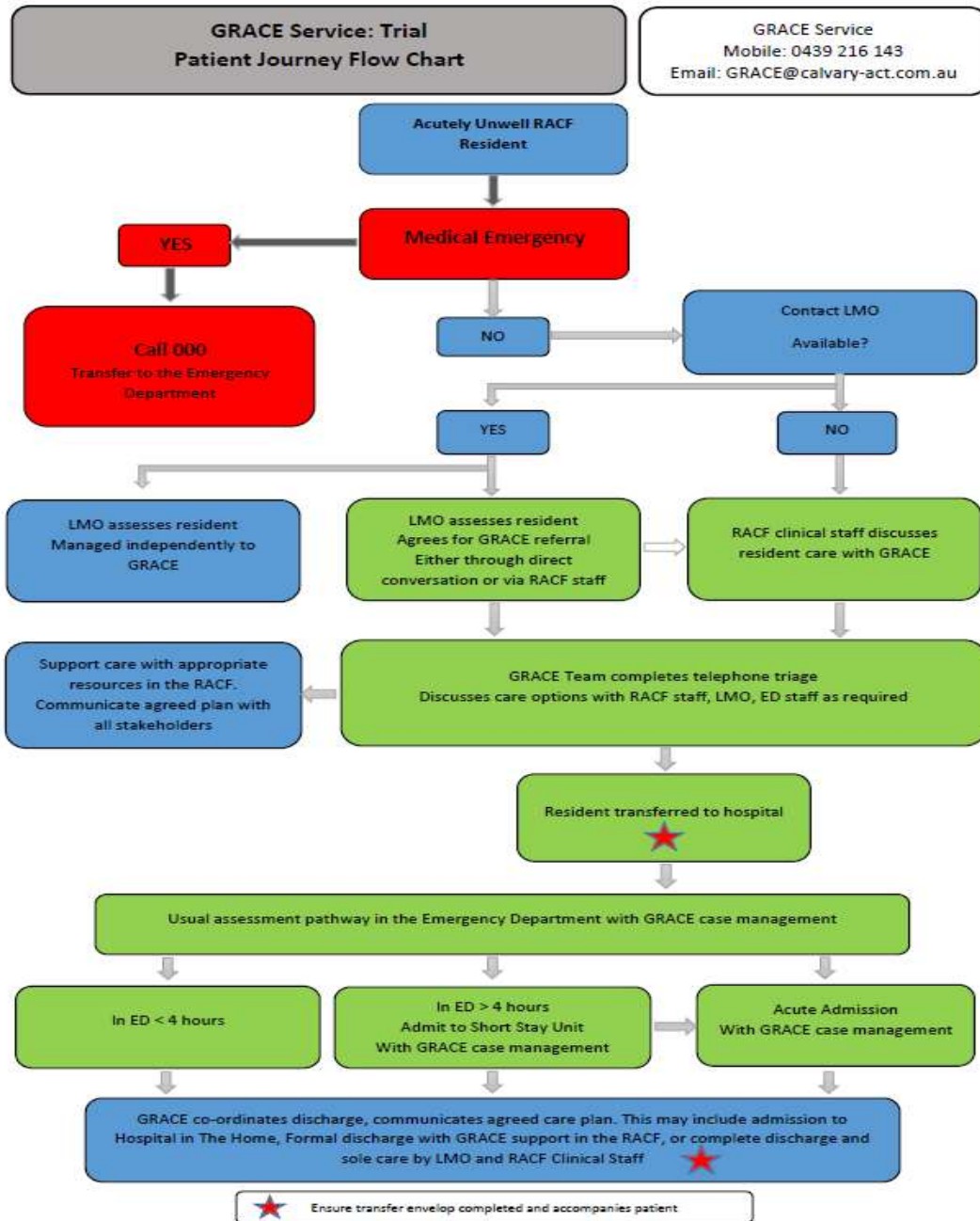
The Service model would be easily transferable to other acute hospitals of any size wishing to commence a GRACE Service with similar service streams and objectives.

The Service model would also be transferable to other care settings, to include enhanced nursing care for acutely unwell residents within a home setting, which currently falls outside the scope of the HiTH service.

The model could also be applied to disease specific outreach services particularly targeting chronic disease groups.

APPENDIX

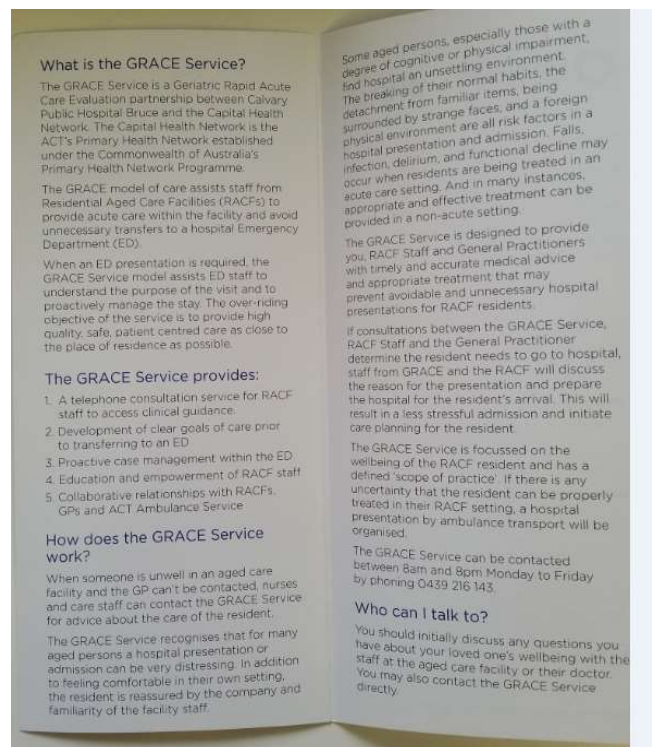
Appendix 1: GRACE Service Activation & Patient Journey Pathway



Appendix 2: GRACE Support and Education Summary

Audience	Support and Education Summary
Consumers	<p>Information sessions at the designated trial sites were provided to residents, clients, patients and their loved ones/carers. These were hosted at regular intervals on agreed dates, and facilitated by the Clinical Managers (CMs). These events were offered as an opportunity to learn more, ask questions and increase awareness of the GRACE Service.</p>
RACF	<p>Trial training sessions for the staff at participating RACFs were undertaken in December 2017, May-August 2018 and December 2018. Sessions included information on patient assessment including early recognition of the deteriorating patient and communication techniques such as ISBAR (Identify, Situation, Background, Assessment, and Recommendation). Based on participant feedback, the content of the training sessions was revised to expand on ISBAR principles.</p> <p>Ongoing education and support was provided regularly, and needs were often identified by Care Co-ordinators. Examples of ongoing sessions included Advance Care Planning and management of urological issues and devices.</p> <p>Informal and opportunistic teaching was frequently undertaken by the GRACE staff on a one-to-one basis, for example suprapubic catheter education.</p> <p>As a result of the education sessions and up-skilling, several RACFs were able to become self-sufficient in some procedures such as uncomplicated indwelling urinary catheter insertion and primary wound management.</p>
GPs	<p>GP visits were conducted to establish a professional relationship with GPs associated with the trial RACFs. The CMs introduced the service and objectives of the trial, and discussed the referral pathway, management and governance guidelines associated with patient care. Communication pathways and modalities were also adapted to the specific requirements of the GPs to facilitate streamlined transfer of information.</p>
CPHB staff	<p>A number of presentations to introduce the GRACE Service were provided to CPHB staff. These sessions were provided across disciplines and operational managers. They were provided regularly throughout the trial period and as the trial progressed. The sessions were also a mechanism of obtaining feedback on the MoC and providing updates on outcome data to staff.</p>

Appendix 3: Consumer Brochure





CLINICAL EXCELLENCE AND PATIENT SAFETY

HIGHLY COMMENDED

Royal Women's Hospital Melbourne

Quality and Safety

Assessment and Care of the Jaundiced Newborn at Home

Carolyn Looney

AIM

1. To improve patient experiences by enabling more mothers and babies to stay together at home, in the immediate postnatal period by assessing the jaundiced newborn and managing care at home, where clinically appropriate, and in doing so reduce the need for this group of newborns, to present to the Women's Emergency Care.
2. To release maternity inpatient resources (beds and staff) for alternate acute patient use.

clinically jaundice and require management with phototherapy. A pathway was developed whereby the home visiting midwife now consults directly with the neonatal medical team and a management plan is developed and communicated back to the parents.

Management options includes: a repeat blood test (SBR) with further review by the home visiting midwife; admission to hospital for phototherapy or admission for phototherapy in the home. For babies who require active management i.e. phototherapy and meet the criteria for Neonatal Hospital in the Home (NHITH) a neonatal admission and review is arranged directly with the neonatal team without mother and baby having to present to Emergency. Baby (and mother) are transferred to the Neonatal Hospital in the Home Team for ongoing management and care with phototherapy undertaken in the home environment.

SUMMARY ABSTRACT

The Royal Women's Hospital introduced two pathways of care to assess and care for the jaundiced newborn at home.

Phase 1 of the 2017/18 project involved the implementation of a pathway whereby home visiting midwives assess and screen for jaundice with a point of care device (Transcutaneous bilirubinometer (TcB)). Where indicated a blood test for Serum Bilirubin (SBR) is then undertaken with the blood specimen delivered by courier back to the hospital for testing. The midwife follows up the results and communicates these back to the parents with a management plan.

This enables mother and baby to stay within the family unit instead of being referred into the hospital (Emergency) for assessment and blood test as was previous practice.

Phase 2 involved the follow-up and management of babies that are assessed as

The newborn screening for jaundice, collection of the SBR in the home, and facilitation of a pathway for direct assessment and admission has resulted in reduced presentations of jaundiced babies to Women's Emergency Care. There were an estimated 420 presentations saved for the project period (Dec 2017 - Oct 2018).

In addition, the management of phototherapy in the home has released an estimated 329 maternity inpatient bed /cot bed days and resources which can be re allocated for alternate patient use. (April 2018- Oct 2018, based on phototherapy at home patient days on NHITH).

HIGHLY COMMENDED

Karitane

Karitane Toddler Clinic

Internet-Parent Child Interaction Therapy: Improving access to specialised parent training programs for families from rural and remote areas of New South Wales

Jane Kohlhoff, Susan Morgan, Grainne O'Loughlin, Irene Strauss

AIM

The aim of this initiative was to develop, pilot-test and permanently implement Australia's first community-based Internet-Parent Child Interaction Therapy (I-PCIT) service to enable families from rural, regional and remote areas of New South Wales to gain access to specialised treatment and support for disruptive toddler behaviour disorders.

professional parenting programs, but this had not been a possibility for them due to their geographical location.

SUMMARY ABSTRACT

Problem

Childhood disruptive behaviour disorders (DBD), typified by oppositionality and conduct problems, are a prevalent class of mental health disorders in youth (Costello et al., 2003), and often the start of a trajectory towards poor psychiatric outcomes (Campbell, 1995; Briggs-Gowan et al., 2006). Internationally, the recommended standard of care for DBDs is behaviourally-based parent-training programs (Comer et al., 2013), of which Parent-Child Interaction Therapy (PCIT; Funderburk and Eyberg, 2011) has been identified as one of the most effective. PCIT centres around parent-child play sessions, and live coaching by a therapist from behind a one-way mirror using blue-tooth wireless "bug-in-the-ear" microphone devices.

Karitane, a leading provider of early parenting services in New South Wales (NSW), has delivered PCIT to families in South-Western Sydney for over 15 years. Positive clinical outcomes have been demonstrated (Phillips et al., 2008), but the requirement for families to physically attend the clinic for weekly coaching sessions means that families from rural NSW cannot access the program, representing a significant service delivery inequity. In our own qualitative work with parents of young children with DBDs living in rural areas (Kohlhoff et al., 2019) we found that consumers were highly motivated to engage in

Solution

To find and deliver a solution to this problem, we undertook the following steps:

1. Reviewing the research literature: We reviewed available data and learned of preliminary evidence of the effectiveness and acceptability of PCIT delivered via video-conferencing (Internet-PCIT; I-PCIT). In the only available randomized controlled trial (Comer et al., 2017), 40 children aged 3–5 years old with DBDs and living in a large US metropolitan city were randomly allocated to clinic-based PCIT or I-PCIT. Both treatments yielded significant improvements in child DBD symptoms but I-PCIT was associated with a higher rate of 'excellent response'. While both conditions showed similar participant retention and parent-reported treatment satisfaction, I-PCIT was associated with fewer perceived barriers to treatment. This research indicated that I-PCIT was effective, but little was known about applications to real-world rural settings or the Australian context.
2. Forming a team: In early 2017, we formed a team with representatives from Karitane, three NSW Health Local Health Districts (Mid North Coast LHD; Western New South Wales LHD, and South Western Sydney LHD), the Department of Family and Community Services and the University of New South Wales. Together, the team developed a concept for a new I-PCIT program to be delivered by the Karitane Toddler Clinic, made preliminary plans, and formalised roles of partnering organisations.

3. NSW Health Innovations grant funding application: In May 2017, we submitted a funding application to the *NSW Health – Innovation Fund*, to establish and pilot-test a new Karitane I-PCIT service. In September 2017, funding was awarded.
4. Establishing an Advisory Group: In October 2017, we formed an Advisory Group with representatives from the partnering organisations (directors, managers, clinicians, consumers). The group met quarterly with email communication between meetings. The group's role was to advise on all aspects of the project and facilitate collaboration between project partners.
5. Piloting I-PCIT service: From Nov-Dec 2017 key steps included: (i) formalising evaluation methodology, (ii) establishing internal working group, (iii) setting-up procedures/practical protocols, (iv) procuring and setting-up technology, (v) recruiting, training and supervising staff, (vi) establishing and building referral base (advertising/mail-outs to rural health professionals/parents, media exposure, social media outreach, site visits to partnering LHDs to foster and strengthen links with local clinicians). December 2017 to December 2018 was the I-PCIT service delivery & data collection phase.
6. Recommendations: Based on the success and learning from the pilot project, a final project report was written and a series of recommendations were made regarding integration of I-PCIT into the permanent service delivery model of the Karitane Toddler Clinic.

Outcomes

A mixed-methods evaluation approach was integrated into our pilot program from the outset. Outcomes (summarised below) were examined throughout the pilot project to identify issues and monitor progress, and at the end of the pilot period to evaluate clinical outcomes.

1. Review of service statistics: Regular review of service statistics allowed us to track project progress and identify issues. Total numbers of referrals and treatment completions were used as an indicator of program outcomes.
2. Clinical case studies: Two clinical case studies were published in a peer-reviewed journal (11). The article demonstrated program content/processes, the positive clinical outcomes attained for these two families, and also highlighted key challenges and solutions.

3. Qualitative data: Qualitative interviews were conducted with 6 parents pre-I-PCIT treatment and 7 parents post-I-PCIT treatment. Results identified (i) positive outcomes experienced, (ii) specific program components perceived to be valuable, and (iii) overall consumer positivity about Internet-delivery of I-PCIT.
4. Quantitative data: Standardised measures were administered pre- and post-treatment. At an overall group level, results showed I-PCIT to be associated with reduced disruptive child behaviours, increased child compliance and increased utilisation of positive parenting skills ($ps < .05$).

Sustainability

Given the success of the pilot project, efforts were made to ensure sustainability, knowledge transfer and scaling. To this end, the following steps were undertaken:

1. In December 2018, ongoing funding (\$240,000) from the NSW Ministry of Health was obtained to continue service provision throughout 2019.
2. In January 2019, an internal Karitane Steering Committee was formed to develop policies/procedures to ensure sustainability, effectiveness and quality clinical care. The I-PCIT Advisory group was also invited to continue on as a permanent group. All members committed to ongoing participation.
3. From January 2019, ongoing I-PCIT education and supervision has been provided for Toddler Clinic Clinicians. I-PCIT has become "practice as usual" for clinicians at the Karitane Toddler Clinic. I-PCIT service statistics are now reported regularly on organisation departmental dashboards.
4. To facilitate broader implementation/scaling across Australia and internationally, outcomes from the pilot project will be disseminated at 5 conferences, 3 peer-reviewed journals, and via social and traditional media.

HIGHLY COMMENDED

WA Country Health Service

Southwest Hospital sites and Population Health

Care of the Vulnerable Child

Sharlene Abbott, Caroline Vernon, Julie Matters, Katina Jones, Ann Lefroy, Donna Guthridge, Marie O'Donoghue

AIM

A lack of interdepartmental and interagency communication can lead to harm or death of a child. The aim of this quality improvement was to increase the timeliness and effectiveness of communications between all stakeholders across a child's journey through the health system. The goal is to have no adverse events occur due to the safety nets, processes and pathways that are now in place. There has been a shift in culture in the organisation with the outcome being that child protection is truly everyone's business.

SUMMARY ABSTRACT

This quality improvement was initiated after a tragic incident in 2017 involving a young baby who died. The health service instigated a review of the baby's and mother's journey through the health system and the touch points with different services. The review identified a lack of timely and clear communication and knowledge sharing between departments and partner agencies. Each team was working within their own area independently however did not share or hand over any key factors consistently. This identified many gaps in the knowledge of and about a client's journey, especially a vulnerable child. With the introduction of numerous strategies, the aim was to prevent another child dying or being hurt, when lack of timely communications and processes let the child and their family down.

As a result of this review a number of recommendations and initiatives were identified and have been implemented. These recommendations included extensive education and training for vulnerability, identification of family risk factors and risk assessment for all staff. Review of communication and hand-over procedures between antenatal, midwifery, community-based services and key partners. Implementation of a new electronic medical record risk identification and alert process and procedures. Improved systems to allow access and review of client medical records, previous

mental health history and streamlined referral processes.

Western Australian Country Health Service (WACHS) Southwest is situated approximately 200 kilometres from Perth. The region is in the South West corner of the state and covers an area of over 24, 000 square kms. with approximately 178, 000 (ABS 2016) population. There are over 25, 000 (ABS, 2016) children aged 0-9 years, with over 2000 births in the region annually.

The region has one major regional resource centre, Bunbury Regional Hospital where the majority of births occur each year. Five smaller hospital sites support obstetric patients to birth, along with one private hospital. King Edward Memorial Hospital (KEMH) for Women in Perth is our tertiary referral centre for obstetrics. Community based primary health care services are supported by social workers, mental health staff and allied health staff. Community child health nurses (CCHN) offer a voluntary service to all women from birth to 4 years commencing in the first fourteen days after birth.

When a midwife identifies any risk factors for a baby/ies or mother, a Special Child Health Referral is initiated, alerting the CCHN to these risks and any actions taken, for example a referral to a social worker. Identified risk factors can include drug and alcohol misuse, untreated mental health issues, family domestic violence homelessness, and those families with involvement with Department of Communities: Child Protection and Family Support (CPFS).

Our key partners in caring for children and families are CPFS, Department of Education, Southwest Aboriginal Medical Service (SWAMS), General Practitioners and Emergency Department (ED) staff. Of the two thousand births per year approximately fifteen percent are identified as requiring extra care and support due to vulnerabilities or risk factors.

Prior to 2017, each WACHS department and agency had local processes that overall worked well, however, in isolation to one another. These

processes had a history of being adhoc in regard to information and communication sharing for our families and children. CCHNs had their own protocol for operational processes for the care of identified vulnerable populations, which had been in place for approximately one year. At the time of this incident, the process included monthly reviews by CCHN with senior staff, for children who had been identified as having vulnerabilities to ensure that children were being followed up. Separate procedures were in place for clinical review of pregnant women at risk for maternity staff, and social workers.

As a result of high level leadership meetings including those with key partners, a multidisciplinary approach was initiated to close identified gaps looking at all areas of the client's health journey. This included reviewing the client's pre pregnancy history, antenatal and postnatal care, which included access to mental health records and other hospital presentations. Involvement with key partners and health services resulted in the development of Memorandum of Understanding (MOU) with agencies to meet and share information, to ensure the wellbeing of a child.

As recommended, there has been an enormous increase in communication via numerous interdisciplinary and multiagency interactions that now occur. These were initiated from high level leadership meetings between departments and partner agencies. Improved processes and referral pathways to social work and to child health services has occurred. An

increase in awareness and training with a significant number of education sessions held by the Paediatrician were implemented and well attended. Initiation of a now state-wide Child at Risk (CAR) alert system has played a substantial role in improvements. A major shift in organisational culture has occurred enabling change which has been led by strong leadership and a focus on child advocacy. All these enhancements are region wide and now well embedded.

The changes implemented in this quality improvement align with the National Safety and Quality Health Standards (NSQHS) Communicating for Safety and Comprehensive Care and aimed to improve communication and the outcomes for children and families. The changes that will be described below will demonstrate that communication and information sharing has improved.

With increasing communication, the outcomes for the child are improved by having multiple departments and agencies all sharing this responsibility. The outcome for the staff is that these improvements have provided a framework for safe processes for caring for vulnerable children. Finally, the outcome for the organisation has been an increase in awareness of children at risk and the robust procedures have allowed embedding that safe care for children is everyone's business.



CLINICAL EXCELLENCE AND PATIENT SAFETY

TABLE OF SUBMISSIONS

<p>National Critical Care and Trauma Response Centre Clinical Governance Group Establishing a New National and International Benchmark - A Unique Application of the ACHS EQUIP6 Quality Improvement Framework to Australia's National and International Deployable Health Emergency Capability <i>Dr Dianne Stephens, Jane Thomas</i></p>
<p>Northern Sydney Local Health District, Royal North Shore Hospital NSLHD Clinical Governance Unit / RNSH Orthopaedic Ward / RNSH Health Information Service H.A.C.K Hospital Acquired Urinary Tract Infection <i>Wei (Angie) Pang, Janine Carragher, Denis Koong, Rosalie Burns, Rosemary Hills, Miriam Cattell, Nina Rao, Jo Tallon</i></p>
<p>Royal North Shore Hospital Neurosurgery Department, Emergency Department, Children's Ward Partnering with Schools to Rethink Adolescent Concussion <i>Vicki Evans, Danielle Coates, Helen Young, Liz Swinburn, Vince Oxenham</i></p>
<p>Women's and Children's Hospital, SA Child and Adolescent Mental Health Services (CAMHS) A service approach to shared decision making to improve clinical outcomes for children, young people and their families with acute and high risk mental health concerns. <i>Tim Crowley, Dr Mohammed Usman</i></p>
<p>Royal North Shore Hospital Speech Pathology Department Written translated therapy resources for patients with aphasia from Culturally and Linguistic Diverse (CALD) backgrounds <i>Jaclyn Hooper, Krystal Furey, 4th Year University of Sydney Speech Pathology students: Lauren Bassil, Josephine Deng, Japjot Kaur, Jasmine Lo</i></p>
<p>Dr. Soliman Fakeeh Hospital (Fakeeh Care) Quality & Risk Management Department Digitalizing Incident Reports <i>Hala Soliman, Samar Badreddin, Ann Tibalao, Aneesa Mohamed</i></p>
<p>Royal Women's Hospital, Melbourne Quality and Safety Assessment and Care of the Jaundiced Newborn at Home <i>Carolyn Looney</i></p>
<p>Calvary Public Hospital Bruce Innovation and Redesign Unit Trialing a Geriatric Rapid Acute Care Service in the ACT <i>Dr John Merchant</i></p>
<p>Bankstown-Lidcombe Hospital Diabetes Centre Introduction of Retractable Insulin Pen needles in Bankstown-Lidcombe Hospital <i>Megan Stephens, Michelle Griffiths, Sarah Abdo</i></p>



CLINICAL EXCELLENCE AND PATIENT SAFETY

TABLE OF SUBMISSIONS (CONTINUED)

<p>Royal Prince Alfred Hospital Emergency Department Complete Care: Closing the loop for our paramedics <i>Dr. Sinead Ni Bhraonain, Tracy Millen, Bradley Spinks, Paula Sinclair, Natalie Menzie, Sharon Campbell, Nobby Alcalá</i></p>
<p>Karitane Karitane Toddler Clinic Internet-Parent Child Interaction Therapy: Improving access to specialised parent training programs for families from rural and remote areas of New South Wales <i>Jane Kohlhoff, Susan Morgan, Grainne O'Loughlin, Irene Strauss</i></p>
<p>Melbourne Health NorthWestern Mental health Tackling Tobacco in Mental Health Services <i>Shane Sweeney, Suzanne Turner, Lorena Chapman, Rachel Whiffen, Sarah White</i></p>
<p>Royal Prince Alfred Hospital and Agency for Clinical Innovation Nutrition and Dietetics Royal Prince Alfred Hospital (RPAH); 2 Agency for Clinical Innovation (ACI); 3. Institute of Academic Surgery (RPAH) A State-wide Gastrostomy Training Program <i>Sharon Carey, Mel Schier, David Storey</i></p>
<p>WA Country Health Service - SW Population Health WACHS SW - Chronic Condition Care Coordination Service, Bunbury Bunbury Chronic Condition Care Coordination Service <i>Kendra Mutch, Nicole Jeffree, Adam Lyndsay, Jodi Larke</i></p>
<p>St Andrew's Hospital, BloodSafe Program, BloodSafe e-learning Australia, Clinpath Laboratories Critical Bleeding Simulation Project Group Clinical simulation to embed improvements in critical bleeding management <i>Sharon Blaney, Duncan Bamford, Alison Sartes, Trish Roberts, Tina Donaldson, Laura Shandra, David Peterson, Trudi Verrall</i></p>
<p>Hunter New England Local Health District Clinical Governance Preventing Hospital Acquired Venous Thromboembolism <i>Mary Bond, Anoop Enjeti</i></p>
<p>Women and Newborn Health Service Infection Prevention and Management (IP&M) Optimising Influenza Diagnosis and Treatment in Pregnant and Postpartum Women at King Edward Memorial Hospital, Western Australia <i>Danielle Engelbrecht, Dr Michelle Porter, Tamara Lebedevs, Lisa Nicolaou, Catherine Jones</i></p>
<p>Royal Prince Alfred Hospital Royal Prince Alfred Hospital Inpatients Developing Rational Attitudes to pathology ordering: Circumventing Unnecessary Low value Approaches (DRACULA) <i>Dr Jessica Bowen, Dr Jacob Cao, Dr Imre Hunyor, Dr Scott Murray, Hannah Storey, Dr Brian Fernandes, Dr Kathryn Wales, Noel Baidya</i></p>



CLINICAL EXCELLENCE AND PATIENT SAFETY

TABLE OF SUBMISSIONS (CONTINUED)

Gold Coast Health

Occupational Therapy Department

An innovative interprofessional model enhancing care for patients with complex care needs in the hospital acute environment

Jenny Nel, Meagan Hartley, Maree Krug, Phillip Chow, Justine Robinson

Royal Perth Bentley Group

Safety and Organisational Learning Directorate

RPMG Safety Thermometer: a simple five point rating to recognise areas of excellence in clinical safety and quality across the Royal Perth Bentley Group (RPMG).

Russell Tonkin, Samantha Rankin

East Metro Health Service, Royal Perth and Bentley Group

Royal Perth and Bentley Group, Service 3

Rainbow Standard Tick Accreditation

Jill Spears, Barry Hughes, Aaron McArtney, Jane Armstrong

Royal Perth Bentley Group

Choosing Wisely Support Team

Choosing Wisely at Royal Perth Bentley Group

Jessica Casado, Sumit Sinha-Roy

Metro North Hospital and Health Service – Royal Brisbane and Women's Hospital and MNHHS Oral Health Services

Clinical Pharmacology Department, Royal Brisbane and Women's Hospital and Health Improvement Unit, Clinical Excellence Queensland

The Queensland Opioid Stewardship Program – Phase 1 of Opioid Stewardship using the Opioid Prescribing Toolkit in collaboration with local teams of clinicians.

Chompika Pattullo, Benita Suckling, Peter Donovan, Gareth Collins, Jonathan Thompson, Sally Taylor, Mark George

South Western Sydney Local Health District

Liverpool and Macarthur Cancer Therapy Centres

Improving radiotherapy treatment delivery for lung cancer patients through development of Intra-Fractional Imaging and Flattening Filter Free treatment delivery.

Sandie Smith, Cesar Ochoa, Andrew Wallis, Sankar Arumugam, Phillip Vial, Mei Yap, Shalini Vinod, Aitang Xing

Beaufort and Skipton Health Services

Clinical Services

Care of the Older Person – Transition to Practice Graduate Nurse program

Kim Stevens, Kristee Winters, Andrea Flenley

South West Sydney Local Health District - Fairfield Hospital

Fairfield hospital Physiotherapy Department; Ambulatory Care Department; Aboriginal Health Unit

"Aunty Roma's": an Aboriginal and Torres Strait Islander-specific falls prevention program

Minh Pham, Katrina Sing, Kristy Lee White, Leeanne Lindsay

Western Sydney Local Health District, Westmead Hospital

Physiotherapy Department and Neurosurgical Outpatient Clinics

"We've Got Your Back" – A Neurosurgical Outpatient Redesign Project

Katherine Maka, Chrissan Segaram, Andrew Kam, Debbie Sharpe, Emma Clarke, Clementia Yap



CLINICAL EXCELLENCE AND PATIENT SAFETY

TABLE OF SUBMISSIONS (CONTINUED)

Western Sydney Local Health District

NSW Health Education Centre Against Violence (ECAV)

Graduate Certificate in Medical and Forensic Management of Adult Sexual Assault: Building a skilled workforce to respond to the medical, forensic and psychosocial needs of victims of sexual assault

Dr Carol Stevenson, Lorna McNamara, Dr Ellie Freedman, Dr Kathy Kramer, Joanne Campbell, Mary Poole, Maria Woods, Salma Badr

Queensland Health

The Mental Health Co-Ordination Hub and the Co-Responder

Reducing Mental Health Presentations to the Emergency Department: An Innovative Tri-Agency Collaboration

Ben Scamarcia, John Van Beusekom, Emily Harding, Gillian Hayward, Tracey MaGuire, Luke Lindsay

WA Country Health Service

Southwest Hospital sites and Population Health

Care of the Vulnerable Child

Sharlene Abbott, Caroline Vernon, Julie Matters, Katina Jones, Ann Lefroy, Donna Guthridge, Marie O'Donoghue

WA Country Health Service – South West

Rehabilitation Team Busselton Hospital

Busselton Health Campus - "Welcome to Rehabilitation Video"

Jenny Hoskins, Lisa Marshall, Hannah Thomas, Kylie Groves, Stephanie Daniels, Daniel Anderson

Sydney Local Health District - Sydney Dental Hospital and Oral Health Services

Community Oral Health Clinics Sydney Dental Hospitals and Oral Health Services

Early Treatment of Patients Needing Simple Surgical Extractions

Dr Trupta Desai

Albury Wodonga Health Dental Service

Dental Unit

Introductory Waitlist Session

Nicolle Davies, Candace O'Keefe, Sinead McArdle

Sydney Local Health District, Concord Centre for Mental Health

Occupational Therapy Mental Health

Hyperacute Extended Hours occupational Therapy Team, Changing Times for Changing Needs

Julie Bohan



NON-CLINICAL SERVICE DELIVERY

WINNER

Royal Prince Alfred Hospital, in partnership with Chris O'Brien Lifecare Medical Physics Team, NSW

Biomedical Engineering Department

Collaboration and Development of an Innovative Total Body Irradiation (TBI) Bed for the Best Patient Care

Cindy Wang (Lead Author), Luke Khoo (Lead Project), Vince Reynolds, Chin Voon, May Whitaker (Co-Lead Project), Robin Hill, Dane Pope

AIM

The aim of this project is to design and develop a Total Body Irradiation (TBI) Bed through the collaboration between the medical physics and biomedical engineering teams at Royal Prince Alfred Hospital (RPAH). The new TBI bed needs to address the drawbacks of the previous device and be able to deliver improved outcomes in terms of patient safety and care, operation, time efficiency, Work Health Safety (WHS) and Infection Control requirements.

SUMMARY ABSTRACT

Background

Patients receiving a bone marrow transplant will undergo a total body irradiation (TBI) regime, with the aim of achieving significant immunosuppression to avoid graft rejection. The TBI treatment technique varies from centre to centre, dependent on factors such as room configuration, treatment delivery and patient position etc. As the treatment is generally delivered at extended source to surface distance, the standard linear accelerator couch cannot be used. A QI project was proposed at Chris O'Brien Lifecare (Former Radiation Oncology Department at Royal Prince Alfred Hospital) to improve the previous wooden treatment bed due to its age and condition which could not meet the treatment standard and posed a risk to patients' and operators' safety.

Literature reviews and market resourcing has shown that there is no commercial product available to purchase. External product development companies are also reluctant to undertake the manufacture due to the low quantity required, and the cost for external custom manufacture is high. The Medical

Physics team approached the Biomedical Engineering (BME) Department at RPAH to discuss the possibility of manufacturing the bed in-house in the BME workshop.

Method

Consultations and reviews were made with other Radiotherapy centres locally and interstate, considering each centre's TBI bed. Each of the existing TBI beds was individually different and custom made with their own advantages and drawbacks. The most advanced current ones which inspired our design are:

- Lying TBI trolley at Peter MacCallum Cancer Centre, Melbourne

Advantage: motorised Perspex screen for patient access and easy operation;

Disadvantage: Fixed height which requires the patient and operators to use a 2-step footstool.

- TBI bed at Westmead Hospital

Advantage: Height is adjustable by using a hydraulic pump;

Disadvantage: The pumping process is noisy and while elevating the bed, the motion is disturbing for the patient.

Based on reviews and consultation with the multidisciplinary staff (physics, BME, Radiation Therapists, and Clinicians) and patients, and taking into consideration the clinical requirements, patient safety and experience, manual handling, safety, BME ongoing maintenance and infection control aspects, the design criteria for this innovation design were decided as follows:

- Height adjustable: Height should be easily variable using a smooth, silent and reliable electrical motor;
- Height range: Lowest position should allow the patient to sit with feet on the floor with no stool required; maximum high position should meet treatment target position;
- Beam spoiler Perspex: Moveable Perspex screens with lockable feature; secure handles to ensure operational safety and user-friendliness;
- Mechanical safety and Integrity: A proper bed and frame to ensure the safe maximum load;
- Multi-directional lockable castors;
- Infection control: Mattress and frame material suitable for repeated exposure to hospital grade disinfectant and cleaning solutions;
- Cost: In-house manufacture to ensure that a high cost custom manufacture was not needed;
- Meets national standards: The design should meet Australian medical devices standards.

The bed was manufactured as per the design criteria in the BME workshop led by senior mechanical technical officer, Luke Khoo, in continual consultation with a multidisciplinary team of medical physicists, engineers, radiotherapists, manual handling coordinator and infection control consultant. A motorised mechanism was carefully selected to provide a smooth and silent motion; a TGA approved electrical bed was used as the base. The other mechanical structures were fabricated in-house which include the top frame for the bed, lateral guide frame, Perspex beam spoilers, locking holders etc. The project took approximately 15 months to complete with a material cost total of \$10,200. Risk assessments were comprehensively conducted by the RPAH Manual Handling and Infection Control Managers, and they wrote very detailed reports on their assessment. A detailed study was undertaken to ensure appropriate labelling, indicating safe working load, pinch points and other hazards. Stickers were professionally made by an industrial company and attached to the bed. A trial period was conducted and a User Service Manual and Safe Work Practise Manual was written prior to official clinical use.

The intention from the outset was to apply for TGA certification of the treatment bed, the first of its kind to be thus certified. As such, we had built the bed to meet Australian Standards, Work, Health and Safety, and patient comfort requirements.

Result

The bed has been approved by the Therapeutic Goods Administration (TGA) as a general electrical Bed Class I Medical Device with two listed intended purposes:

1. To raise the patient to an adjustable height suitable for treatment.
2. To have relatively homogeneous radiation dose distribution across the bed.

The bed has a 12 months Preventative Maintenance schedule, and an inspection every 6 months for the castors, electrical safety and structural integrity. This Innovative TBI bed is one of the most advanced TBI treatment beds in clinical use worldwide. It continues to be used in the Department of Radiation Oncology Department at the Chris O'Brien Lifehouse and has successfully treated numerous patients. Patients have commented on the comfort and design of the bed. Both Radiation Therapists and Medical Physicists were delighted with the product as its lighter weight and adjustable height made it simpler to set up for treatment, and move for transport and storage. The accessibility features built into the design significantly improved the treatment operation flow and saved preparation time by up to 75% and treatment time by up to 30%. Additionally, the OH&S- friendly features allow for better staff ergonomics and easy access to the patient in case of emergency or distress.

Conclusion

This TBI bed has set a benchmark and many other centres have approached us to seek the possibility of making the same product. The design involved careful mechanical and dosimetry calculations of the combination height, weight and materials required to achieve a safe and accurate patient treatment delivery, with consideration for patient comfort, safety and operational efficiency. It is a clever design based on the modification of a commercial bed, taking advantage of the expertise of traditional treatment bed manufacturers such as safe working load, castors for ease and safety for manoeuvrability, and actuator extension performance. The design reduced product development time and simplified the process for TGA approval. It is a great example of collaborative innovation - made to fit the purpose which resolved a clinical demand and benefitted patients.

REPORT**APPLICATION OF ACHS PRINCIPLES****1. Consumer Focus**

- An initiative for improving patient safety and the treatment experience

Total Body Irradiation treatment is a form of radiation therapy used as a conditioning regimen for some types of Leukaemia, Lymphoma or Myeloma. It is primarily used in conjunction with high dose chemotherapy as part of the pre-conditioning preparation for blood stem cell or bone marrow transplant. A course of TBI treatment is usually given twice a day over 1-3 days with each fraction taking between 45-60 minutes to complete. It is a daunting experience for the patients to maintain still during the lengthy treatment, hence providing a comfortable treatment device is our priority to these patients.

A range of engineering design has been put in to the product to provide extra comfort and safety for patients. A unique and silent motor was used to ensure the lifting process is smooth and calm which provided the patients with greater confidence in treatment. The adjustable height enabled patients to sit on the bed at the low position, without any steps or stools, hence reducing the risk of falling. Extra space on the bed allows patients to move and change position if needed in between radiation delivery, which means a relief to a lot of patients in poor health who are struggling to maintain the same position during the entire procedure. Quick release head and foot Perspex allows immediate access to the patient in case of emergency or distress, such as vomiting or cardiac arrest.

- Public information is provided to patients and induction is given before treatment

There is detailed treatment information with a picture of this TBI bed available to patients and public on the Lifehouse website and an induction is provided to the patients one week prior to treatment, which includes an explanation of using the TBI bed and safety precautions.

- User friendly from a clinical perspective

Radiotherapists and Medical Physicists are responsible for the patient's set up and radiation delivery during treatment, and provide quality control, transporting and storing the TBI bed. The TBI bed has detailed safety and manual handling features to ensure the treatment staff is working safely, without injury, while they focus on the patients. These features include transportation handles on each side of the bed, a specially designed tool to assist alignment of the wheels, which also mitigates the need for

repetitive bending, obvious labelling for pinch points, and the sliding design of the Perspex beam spoiler screen which allows staff to avoid excessive lifting. The TBI bed needs to be transported and operated by two staff members as documented in the Safe Work Procedure and evaluated by the manual handling coordinator.

2. Effective Leadership

- Team building: a multidisciplinary team

The project was initiated by the Medical Physics team, investigating the possibility of building an in-house manufactured, high standard medical device to replace the previous wooden bed which constantly posed an OH&S risk to staff and patients. The Biomedical Engineering RPAH mechanical team had been known for many projects where specified design and fabrication were made to assist research projects and enhance the safety and efficiency of clinical applications. A multidisciplinary team was formed which included medical physicists, biomedical engineers (electronics and mechanical), radiation therapists, a manual handling coordinator and infection control manager. This permitted each team member to provide their expertise in their field, which was the key to the successful outcome.

- Consultation and collaboration

The Directors of Biomedical Engineering and Medical Physics offered great support for this project and provided strategic direction through the design and manufacture process. Meetings and regular review were conducted to ensure the success of the project and staff members collaborated well with excellent communication. The end product differed slightly from the original design; however the constant communication with the multidisciplinary team allowed the organic evolution of the design into the final product. This was in the form of reviews at each stage of the manufacture, ensuring all teams were satisfied, or consulting on any required changes, before moving on to the next stage.

- Risk assessment and mitigation

Risk Assessment has been conducted as per NSW health risk management policy by consultation with the below team:

1. RPAH Infection Control Consultant – Elizabeth White
2. RPAH Manual Handling Coordinator – Leo Dimarco
3. Lifehouse End Users – Nicole O'Brien (Radiation Therapy), May Whitaker (Medical Physics)

- Regulation and Monitoring

This TBI bed is the first and only TGA approved TBI treatment bed which has been manufactured in a hospital by the Biomedical Engineering Department. TGA approval allowed the new device to be used in a regulated manner and mitigate the clinical risk. BME continues provide consultation and monitoring of the TBI bed and provide a sustainable service plan with spare parts and troubleshooting guide.

3. Continuous Improvement

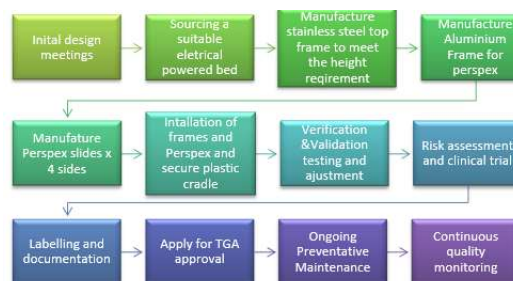
There were several drawbacks and safety risks with the previous wooden bed as below:

- Clinical Requirement (Medical Physicist): The TBI technique requires a Perspex screen to increase the entrance radiation dose and scatter, or spoil, the radiation beam, as well as improve visibility and ease of alignment. The side panels on the old wooden bed were tremendously large and heavy sheets of Perspex which had to be manually lowered outwards and down, posing an OH&S hazard to the staff, and hindered accessibility to the patient in case of emergency. The length and width of the bed needed be increased for patient comfort and positioning, and ease of access to place necessary treatment accessories and radiation dose monitoring devices.
- Patient Safety and Experience: The wooden bed was built with a fixed height. Patients needed to use a 2- step stool to enter in. However, many of the TBI patients lacked mobility and were in poor physical condition, making it difficult to enter the bed with the stool, which also posed a significant risk of falls. The treatment normally takes 40-60 minutes twice a day, and requires the patients to lay very still. A more comfortable bed space would significantly enhance the patient's experience. In addition, a more professional looking bed would increase the patient's emotional confidence for the treatment and the organisation image.
- Manual handling safety and user friendly (Radiation Therapist and Medical Physicist): The old wooden bed had no proper handles for transport and the wood panel blocks the line of sight when moving. It is only accessible from the lateral sides which made it difficult for staff to place and position treatment accessories. The staff also needed to stand on the step stool to set up patients, which also posed a fall risk. The side Perspex screen opened in a folding-out method which required extra force and space. The preferred design is a slide downwards for better OH&S, ease of

access to the patient and minimised space requirements when moving the screen.

- Preventative Maintenance and troubleshooting (BME): The wooden bed is in Not Safe for Clinical Use (NFCU) condition with no established maintenance schedule. The new design should ensure the product meets Australian Standards and is safe for clinical use with a PM schedule, troubleshooting guides and spare parts.
- Infection Control: The wooden bed has a foam mattress and an improvement was to replace it with a more infection control compliant slimline, medical grade mattress. This would permit the staff to use clinical approved chemicals to wipe down the mattress between patients and ensuring there are no folds or corner which could harbour transmittable diseases and germs. Additionally, the wooden panelling was not compliant with infection control.

To address the above, the product was developed through the below procedure and continuous improvement has been implemented though each step from concept to a finished product:



An important design consideration of this bed was the height adjustment criterion, that it be manufactured to our specifications derived from consultation with the therapists and patients. We arrived at a comfortable and safe low height which allowed ease of use and facilitated patient's entry and exit to and from the TBI bed.

4. Evidence of Outcomes

The innovation and quality improvement outcomes have been evaluated in the below table with details:

Aspect	QI and Innovation Outcome	Details
Patients safety	Significantly improved	<ul style="list-style-type: none"> Strong stainless steel bed frame and aluminium frame for Perspex screen ensures a safe and practical working load of 220 kg patient weight Quiet, comfort and stable when raising the bed to maximum height No step stool required and easier for patients to enter and lay down Nylon nuts to prevent bed components from loosening Enhanced bed mattress material for more comfort and best infection control Fully accessible from all 4 sides of the bed in case of patient emergency or distress
Operation friendly	Improved	<ul style="list-style-type: none"> No sight obstruction when transporting the bed Electrical powered bed makes it easy to adjust the height for all needs Fully accessible and convenient for patient set up and to place dose measurement devices Relatively light weight and adjustable height makes it easier for transport and storage
Organisational	Improved	<ul style="list-style-type: none"> More professional appearance of the new TBI bed which improves the organisational image and gains trust of patients and staff
Financial	Cost and time saved	<ul style="list-style-type: none"> TGA approved medical device mitigates organisational risks In-house manufactured for low cost Able to treat more patients per day on the linear accelerator due to reduced preparation time for the TBI patient

5. Striving for Best Practice

The TBI bed has set a benchmark and many other treatment centres have approached us for the design and development process. We have received positive patients' and staff feedback.

The TBI bed has won second prize in the Australia Biomedical Engineering Innovation Award (ABEIA) 2019 and was presented at the SMBE conference which is recognised in Biomedical Engineering as a great example for design and manufacture clinical applications.

Further improvements could be made by sourcing alternative materials which have strong mechanical properties but lighter weight and frame fixation techniques. This would decrease the frame weight and improve the maximum loading capacity. It will not only allow more and heavier patients to be treated but also make it easier to transport the bed.

INNOVATION IN PRACTICE AND PROCESS

As there is no commercially available TBI bed, this product is one of the best available TBI devices in Australia with the below innovative features:

- Slide down and secure lock Perspex screen
- Silent motor for a smooth and steady lift from low to high position
- An in-house designed and built product with a low cost
- The first TGA approved Australian Standard medical device for the purpose of TBI treatment

APPLICABILITY TO OTHER SETTINGS

This product has been used as a benchmark of the TBI technique and paves the way to

standardised and improved TBI treatment outcomes. The design could be adopted by other centres nation-wide and as a global reference.

Biomedical Engineering plays an important role in the hospital. The successful outcome of this project sets an example of how BME can help clinical staff in the research and development of projects and building clinical devices and applications in a regulated environment.

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Appendix 1: Photos

A) Radiation Therapists transporting the new TBI bed with safe manual handling features.



B) Radiation Therapists setting up the patient using the new TBI bed (accessible on four sides with electrical powered height movement).



C) The previous wooden TBI bed with rudimental construction causing discomfort to the patient.

Appendix 2: Specification of the new TBI bed

Dimensions:	Overall width 790 mm Overall length 2000mm Height to platform top 1090 mm Max 655 mm Min
Product weight:	152kg (approx.)
Electrical data (230V):	Power in 1.5A max at 230 V a.c.50Hz Duty rating intermittent 10%, Max,2min./18min. Electrical safety standard complies with EN 60601-1 1998 Electrical shock protection Class II Liquid ingress protection IP54
Storage and Transport condition:	The equipment should be stored in a clean dry and well-ventilated area. The following limits apply during transport and for a storage period up to 15 weeks. Ambient temperature: -25degrees to +70 degree. Relative humidity: 10% to 75%. Air pressure: 50Kpa to 106Kpa. The following limits apply to operating conditions on longer periods of storage. Ambient temperature: +10 degrees to +40 degrees. Relatively humidity 30%to 75%. Air pressure 70Kpa to 106Kpa

Appendix 3: Letter of Support**ABEIA Total Body Irradiation (TBI) Bed Letter of Support**

February 13, 2019

Dr Robin Hill & Mr Dane Pope
Chris O'Brien Lifehouse
119-143 Missenden Road
Camperdown NSW 2050

Dear ABEIA committee members

It is our pleasure to provide a letter of support for the Total Body Irradiation (TBI) Bed application in the Australian Biomedical Engineering Innovation Awards.

Total body irradiation (TBI) treatments are an arduous process which require efficient practices in order to provide a valuable service to our patients. TBI treatments involve the delivery of low level radiation doses to help facilitate bone marrow transplant patients. Each year, we treat a number of these patients who are required to lie down for treatment for about an hour each session. Our desire to provide the best possible care to our patients was the inspiration for the collaboration and development of the departments TBI bed.

Given the nature of TBI treatments, it is essential that the bed be lightweight, strong, comfortable, compact, easy to move and operate as well as having the ability to be cleaned in accordance with infection control procedures. It is our strong belief that this design incorporates all of these features and has made the departments TBI procedure more effective over previous methods.

Previous TBI treatments may have taken over an hour to complete and we are now finding that we can get these treatments down to about 40 minutes in some cases. Our staff are more confident in working with the new bed and we have also found that this new design does not restrict patients of a particular shape which was the case with the previous bed. This is extremely important as patient comfort is one of the main factors that can disrupt long course treatments.

We have been frequently contacted by other departments about the development of our TBI bed and their desire to follow our design, which highlights how successful this device has, and continues to be. Our staff have acknowledged on many occasions that this innovation has greatly improved the quality of treatment as well as providing patients with a level of ease in what is generally a difficult period of their journey. We are greatly appreciative of this device and could not state how important this device is to our practice. We commend the hard work and dedication put into this innovation and we hope this is also recognised by the committee.

Kind regards,

Handwritten signature of Dr Robin Hill in blue ink.

Dr Robin Hill – Director of Medical Physics

Handwritten signature of Dane Pope in blue ink.

Dane Pope – Medical Physics Registrar



NON-CLINICAL SERVICE DELIVERY

HIGHLY COMMENDED

Royal Perth Bentley Group

Emergency Department

Volunteer Concierge Project in the Emergency Department

Sarah Louise Moyes, Julie Knuckey, Hayley Makuch, Simon Elliott, Sara Lavis

AIM

The Volunteer Concierge Service was created to provide an interface between staff within the clinical area of the Emergency Department (ED) and the family, carer or support person in the ED waiting room. This service was implemented to aid the timely provision of a support person(s) to patients receiving care within the RPH Emergency Department, thereby improving care partnerships and patient/consumer experience. A secondary aim was to reduce the occurrence of episodes of violence/aggression in the ED waiting room related to delayed access to patients or provision of information on patient status.

SUMMARY ABSTRACT

The volunteer concierge team was introduced to the ED in January 2018. A core group of volunteers were orientated to the ED, and worked closely with the triage liaison nurse. This role was introduced to improve our service to patients and relatives, and supplement the nursing component of consumer focus in the waiting room. The consensus of staff and volunteers is an observed increase in consumer satisfaction in the waiting room as well as high rate of staff satisfaction with the volunteers themselves. This has also been reflected in a steady increase in patient satisfaction after the implementation of the service. The concierges also facilitate the ED to deliver on components of The Australian Charter of Healthcare Rights for patients, specifically the rights to respect, partnership and information. Now that the volunteers are thoroughly embedded in our service delivery the ED has been able to improve the triage model of care and provide more senior nursing leadership in this area, benefiting both staff and patients.



NON-CLINICAL SERVICE DELIVERY

HIGHLY COMMENDED

Royal Perth Bentley Group

Centre for Wellbeing and Sustainable Practice/Postgraduate Medical Education

Well, Well, Well – A good state of being

Richard Read, Michael Hertz, Nicola Frew, Lucy Kilshaw

AIM

We believe that every person connected with Royal Perth Bentley Group deserves the best possible care and wellbeing. To that end, we provide compassionate spiritual care for patients and their loved ones, services to enhance the wellbeing of our employees, advocacy for cultural change to better support these values and professional education anchored in the values of reflective and compassionate practice - all underpinned by rigorous research and professional collaboration.

SUMMARY ABSTRACT

In February 2019, the Royal Perth Bentley Group (RPBG) launched the Centre for Wellbeing and Sustainable Practice (CWSP) at Royal Perth Hospital (RPH) to more accurately reflect the evolving perspective and practice of Spiritual Care. The Centre brings together spiritual care practitioners providing compassionate care for patients, education programs for reflective and compassionate practice such as Clinical Pastoral Education (CPE) and professional development courses as well as associated research projects and conference presentations. The success of our approach is evidenced by increasing requests from other hospitals to teach our programs to their staff.

Our team of trained Spiritual Care practitioners provide an exceptional standard of spiritually and culturally appropriate care, offering patients the opportunity to explore issues arising amidst their health challenges. In 2018, our team provided 25,000 one-to-one patient visits with over 6,000 hours of spiritual care delivered.

The expansion of our programs to include staff has its origins in 2016, in response to the suicide of a junior doctor. Widespread consultation resulted in the creation of a Doctors' Wellbeing

Officer (WBO) position sourced from within the then Pastoral Care Department. An additional benefit of this was the opportunity to draw on the expertise of the department's CPE Educator in developing an innovative peer group model for junior doctors.

Over the past 3 years, the numbers of both junior medical officers (JMOs) contacting the WBO for individual meetings and interns participating in voluntary peer group sessions has steadily increased. The benefits of these sessions are evident in the Australian Medical Association WA's Hospital Health Check survey of JMO wellbeing, showing that RPH is the best-ranked public hospital for morale and culture (Wood, R et al, 2018).

The success of the Doctors' Wellbeing program was the catalyst for the expansion of wellbeing services for all staff. With the stated goal of becoming Australia's safest hospital group, the issue of addressing staff care and wellbeing became crucial to improving patient care and outcomes. A hospital-wide education program has been launched under the name 'Bonstato' ('good state') the goal of which is to place a trained Wellbeing Champion in each hospital team to foster employee wellbeing, team cohesion and a positive work environment.

CWSP has also embraced an important role in RPBG's response to incidents that impact whole teams within our workforce. Alongside mandatory clinical debriefing, CWSP offers team wellbeing sessions where members can reflect on and share the impact of their experiences. These sessions are receiving strong support from staff affected by such events. Ongoing individual support and referral to additional services are also offered where appropriate.

The Bonstato Wellbeing training program is anchored in the principles of CPE, an internationally recognised foundation for training Spiritual Care Professionals in the art of reflective listening, spiritual assessment, therapeutic response and interdisciplinary collaboration. The aim of the CPE program is to promote reflective practice and spiritual care skills throughout healthcare, educational and industrial contexts, especially by and for those who embrace a more secular spirituality. In the past two years, numbers of RPBG CPE applicants have increased dramatically, to nearly twice the number of available positions.

These courses have enabled staff to recognise that spiritual care is an essential component of care for patients who are struggling with meaning, relationships and a sense of purpose. Staff themselves are wrestling with these same issues as they experience the personal impact of exposure to stressful and challenging situations. These education programs are a key component of improving hospital culture.

CWSP is driving organisation-wide cultural change on a number of levels. With the Doctors Wellbeing Program empowering JMOs to find their voice and learn to advocate for themselves and their peers, they were able to raise the conversation about unpaid overtime in the appropriate arena leading to our Executive Director going on record in 2017 to state that unpaid overtime for JMOs at RPBG will no longer be tolerated.

Furthermore, the notion of wellbeing becoming more entrenched and reinforced by the Executive is evidenced through increasing calls on CWSP for staff support. In the aftermath of a recent violent incident where a nurse was assaulted by a patient, CWSP was approached to provide support to multiple teams affected by the incident.

Our Executive Director recently wrote to all RPBG staff promoting Bonstato saying, *'I would personally like to see each ward and area in our*

hospital championing wellness and would encourage all staff to consider attending one of these courses.' (RPH News, Message from Executive Director, 5 July 2019). The enthusiastic employee response to participation in Bonstato with fully subscribed courses across 2019 has resulted in funding for additional CWSP staff.

CWSP is currently undertaking two research projects: a JMO Wellbeing Project studying the impact of participation in peer groups in which preliminary data analysis demonstrates the correlation between increased resilience and participation in peer groups and a Nursing Wellbeing project assessing the impact of spiritual care practices on nurse wellbeing. Nursing peer groups are currently in session with final data collection scheduled for late November.

Interest in 'the RPH model' has expanded beyond RPBG. Over 2019/20, a grant from the Postgraduate Medical Council of WA (PMCWA) to CWSP is supporting a series of full-day educational workshops for JMOs and medical educators from other hospitals across WA. Sessions for the remainder of 2019 are fully subscribed and rollout will continue into 2020.

Our vision to care for patients, staff and hospital culture, supported by education and research is being increasingly embraced by other hospitals and health services across WA. Recognition beyond WA is evidenced by regular presentations at national medical education meetings. Furthermore, in 2019, CWSP was awarded a Best of Care Award for Outstanding Spiritual Care Team by Spiritual Care Australia, the peak professional body for spiritual care in Australia.



NON-CLINICAL SERVICE DELIVERY

TABLE OF SUBMISSIONS

<p>Northern Sydney Local Health District Workforce & Culture FluPortal: Enabling large scale vaccinations <i>Pavin Govinda, Laura Brain</i></p>
<p>Epworth Healthcare Richmond Food Services Transition to Excellence Through Room Service Dining <i>Nazim Bayrak, Deirdre McKaig, Noeleen Xerri</i></p>
<p>Royal Flying Doctor Service – Tasmania Mental Health Program From Good to Great – Primary Mental Health Program RFDS Tasmania <i>Nicole Grose, Zoe Page, John Kirwan</i></p>
<p>GenesisCare Patient Experience (PX) Team The Patient Experience (PX) Playbook at GenesisCare <i>Fallen Guthrie, Ada Ryan, Petra Klauzner, Adrian Ireland, Dr Chelsea O'Connor, Bronte Kerr</i></p>
<p>Southern Adelaide Local Health Network Consumer Engagement Unit To Listen, Act, Make Better, Together... The journey of a co-designed Consumer Engagement Framework, Plan and organisational operating principle. <i>Mellita Kimber, Peter King</i></p>
<p>Royal Prince Alfred Hospital, in partnership with Chris O'Brien Lifehouse Medical Physics Team Biomedical Engineering Department Collaboration and Development of an Innovative Total Body Irradiation (TBI) Bed for the Best Patient Care <i>Cindy Wang, Luke Khoo, Vince Reynolds, Chin Voon, May Whitaker, Robin Hill, Dane Pope</i></p>
<p>Royal Perth Bentley Group Emergency Department Volunteer Concierge Project in the Emergency Department <i>Sarah-Louise Moyes, Julie Knuckey, Hayley Makuch, Simon Elliott, Sara Lavis</i></p>
<p>Fiona Stanley Hospital Cleaning, Facilities Management, Serco Implementing a Patient-centred Cleaning Audit System – a risk-based approach <i>Nicole Sarader, Breffni Doyle, Shane Van Dyk, Dawn Smith, Quentin Tapley, Sheila Suppiah, David Gryguc, Kristie Popkiss</i></p>
<p>Royal Perth Bentley Group Centre for Wellbeing and Sustainable Practice/Postgraduate Medical Education Well, Well, Well – A good state of being <i>Richard Read, Michael Hertz, Nicola Frew, Lucy Kilshaw</i></p>
<p>Gold Coast Hospital and Health Service Mental Health and Specialist Services Psychosocial Interventions Framework <i>Grace Branjerdporn, Alice Almeida-Crasto, Dr Shailendhra Bethi</i></p>



HEALTHCARE MEASUREMENT

WINNER

Royal North Shore Hospital

Intensive Care Unit

Reducing Inappropriate Arterial Blood Gas Testing in a Quaternary Intensive Care Unit

Dr Oliver Walsh, Katelyn Davis, Dr Jonathan Gatward

AIM

To identify the indications for arterial blood gas (ABG) analysis in our Intensive Care Unit (ICU) and reduce the number of unnecessary ABGs performed, without compromising patient care.

SUMMARY ABSTRACT

Introduction: Arterial blood gas (ABG) analysis is the most frequently ordered pathology test in the Intensive Care Unit (ICU), carrying a high cost and contributing to iatrogenic anaemia. Ordering is largely driven by cultural factors and a significant proportion of tests are not clinically indicated.

Objectives: To identify the indications for ABG analysis in the ICU and reduce the number of inappropriate ABGs without compromising patient care.

Methods: The multidisciplinary project team surveyed the indications for ABG analysis at our 58-bed quaternary ICU during fortnightly periods before and after a multifaceted intervention. This consisted of several education initiatives targeting medical and nursing staff and the introduction of a clinical guideline. The number of ABGs performed from July to December 2017 (pre-intervention) was compared with the number performed during July to December 2018 (post-intervention). Tests were defined as inappropriate if performed at regular time intervals in a stable patient, at change of shift, when taken concurrently with other blood tests, in response to a decrease in ventilation or oxygen delivery, or after a treatment was ceased in a stable patient. The study was enrolled on the local Quality Improvement Projects Register and ethical approval waived by the local ethics committee.

Results: The proportion of inappropriate ABGs decreased from 54.8% to 28.9% between the two surveys. The number of ABGs decreased

from 33,005 in the first six-month period to 22,408 in the second (a 31.3% reduction when adjusted for ICU bed-days, $p < 0.001$). This corresponds to an average of 4.6 ABGs per bed-day during July-December 2017 compared to 3.1 per bed-day in the post-intervention period of July-December 2018. All four ICU 'pods' demonstrated a decrease in the total number of ABGs performed by at least 20%. This represents an annual saving of approximately \$800,000, as well as 100 litres blood and 1,800 nurse-hours (approximately 1.0 FTE). There was no significant difference in the standardised mortality rate (APACHE III) between the two periods (0.65 vs 0.63, $p = 0.22$). Initial analysis of July 2019 data showed an average of 3.2 ABGs per bed-day; indicating durability of the change in practice brought about by our intervention.

Conclusion: Clinician education and the implementation of a clinical guideline resulted in a substantial decrease in both the proportion of inappropriate ABGs and the total number performed, resulting in significant cost savings. If similar results could be attained in many other ICUs in Australia and New Zealand this would lead to dramatic cost savings. This project is applicable to other critical care areas such as coronary care units.

REPORT

APPLICATION OF ACHS PRINCIPLES

1. Consumer Focus

Arterial blood gas (ABG) is a rapid point-of-care test that accounts for over 80% of all tests ordered in the intensive care unit (ICU) setting (Ullman 2016, Astles 2009). On average 4-8 ABGs are performed per patient per day, with the frequency of testing generally proportional to patient acuity (Ullman 2016, Merlani, 2001,

Roberts 1991, Pilon 1997). The processing fee for each test in Northern Sydney Area Health District is \$35.34 and the consumables (syringes, gauze, alcohol wipe) account for a further \$1.91 per ABG, bringing the final cost per ABG to \$37.25. The test requires approximately 5mL of the patient's blood and at least five minutes of the bedside nurse's time to perform.

Prior to this project our 58-bed quaternary level ICU performed approximately 65,000 ABGs annually. This equates to over \$2.4 million in processing fees and consumables, and requires more than 330 litres of our patients' blood as well as over 5,500 nurse-hours (more than three full time equivalent staff). Performing unnecessary ABGs has several adverse impacts on patients, in addition to the obvious financial implications. Most importantly the blood loss has been shown to contribute significantly to the development of iatrogenic anaemia and subsequent need for blood transfusion, the so-called "anaemia of chronic investigation" (Barie 2004). 95% of ICU patients are anaemic by day 3 and almost half receive red cell transfusions during their ICU admission (Corwin 2004, Rodriguez 2001). Blood transfusions cost over \$400 per unit (Australian Red Cross, 2016) and are independently associated with increased length of stay and mortality in critical care patients (Corwin 2004, Vincent 2002). 30% of all transfusions in critical care are attributed to phlebotomy (Hayden 2012, Corwin 1995). Other detrimental effects include increased risk of infection due to frequently accessing arterial catheters, discomfort and interruption to sleep with the subsequent increased risk of delirium. Finally, as well as the time taken performing this task, there is increased risk of splash injury to staff every time an arterial line is accessed.

2. Effective Leadership

The core project team included an Intensive Care Registrar, Intensive Care Consultant, and the 'Quality Co-ordinator' Intensive Care Nurse. Additionally, there were two clinical nurse 'champions' in each of the four separate ICU pods who were involved in the dissemination of the educational content and advocated for the surveys to be completed. This multidisciplinary approach enabled us to identify the various impacts that excessive ABG sampling had on the delivery of high-quality patient care. The team met at least monthly in the lead up to implementation. A thorough review of the literature consolidated our knowledge about the topic. We then designed a multifaceted education intervention which was delivered in the interim six-month period (January-June 2018) between the two six-monthly study periods (July-December 2017 and 2018).

The intervention consisted of three major components. An in-service was developed that focussed on the cost, number and reasons that ABGs were performed, as well as a case-based discussion of acceptable and unacceptable indications. This was delivered by the clinical nurse champions ad-hoc, approximately twice weekly in each pod for 12 weeks, when clinical duties allowed. These sessions were attended by 70% of the 223 nursing staff and many of the junior medical officers. Secondly, our project team presented twice at the local ICU Quality Forum which gave all medical and nursing staff the opportunity to contribute. Lastly, a clinical guideline for ABG testing was developed in consultation with all specialists, fellows and senior nurses in the ICU (see appendix 5, figure 20). Minor aspects of our intervention included displaying information on posters around the ICU, writing an article each month in the local ICU newsletter and posting on private social media groups to update staff on the progress of the project.

The intervention was developed under guidance from the Intensive Care Best Practice Group, of the Agency for Clinical Innovation. It was endorsed by the ICU Director and ICU Nurse Manager. Regular feedback was sought from the entire Intensive Care staff body.

3. Continuous Improvement

We investigated the local indications for ABGs by conducting a survey during a fortnight in the pre-intervention phase (see appendix 2, figure 13). These results were compared to an identical time period after our intervention. We then compared the number of ABGs performed over a six-month interval in each of the four "pods" (two general ICUs, one cardiothoracic ICU and one neurointensive care) before and after the intervention. Results were adjusted for occupancy using ICU bed-days.

A pilot study was conducted during the fortnightly survey periods in both the pre- and post-intervention phases. Results from this suggested a decrease of greater than 40% in bed-day adjusted number of ABGs as a consequence of our intervention; 2869 vs 1397 ABGs performed with less than 8% difference in occupancy between the periods.

Final results comparing the six months post-intervention to the six months prior to it revealed an overall 31.3% bed-day adjusted decrease in the number of ABGs across the four ICU pods (see further details in 'evidence of outcomes')

To assess for continuous improvement, the July 2019 data was sought. There were 4,419 ABGs was not yet available at the time of writing this report. Using an average of the number of bed-

days in July 2017 and 2018 (1359), a final figure of 3.25 ABGs per bed-day was calculated. This is comparable to the 3.1 for July-December 2018 and suggests a durable change from the 4.6 per bed-day in the pre-intervention period of July-December 2017.

We plan to compare our post-intervention data to the same six-month period each year, to more accurately assess the durability of the project.

4. Evidence of Outcomes

709 surveys were completed during two-weeks in the pre-intervention phase and 417 in a similar period post-intervention. After implementation of the clinical guideline there were significantly more ABGs performed in response to a clinical deterioration (8.0% vs 17.7%) and significantly fewer for 'cultural reasons' including routine monitoring at regular time intervals, shift changes or when other blood tests were taken (26.9% vs 9.7%). There were also fewer ABGs ordered after changes in oxygen delivery or ventilator settings (17.2% vs 8.6%). A significantly greater amount were performed to guide infusions (16.9% vs 30.5%) and other treatments many of which are governed by pre-existing policies that mandate regular ABGs such as continuous renal replacement therapy (CRRT) (3.4% vs 9.1%). Overall the proportion of inappropriate ABGs decreased from 54.8% to 28.9% between the two surveys (see appendix 3, figures 15-18). The proportion of doctor-initiated ABGs increased from 10% to 22%, with the remainder being nurse-initiated.

There were 33,005 ABGs performed in six months prior to the intervention and 22,408 in the post-intervention period; a reduction of 32.1%. The two periods had similar occupancy; there were 1.2% fewer bed-days in the post-intervention period. This 31.3% reduction when adjusted for ICU bed-days ($p < 0.001$) corresponds to an average of 4.6 ABGs per bed-day during July-December 2017 compared to 3.1 per bed-day in the post-intervention period of July-December 2018 (see appendix 1, figures 1 and 2). This represents an annual saving of approximately \$800,000 as well as over 100L of blood (equivalent volume to 350 blood transfusions) and 1,800 nurse-hours (approximately 1.0 FTE). There was no significant difference in the standardised mortality rate (APACHE III) between the two periods (0.65 vs 0.63, $p = 0.22$)

On average over the six-month periods the cardiothoracic ICU (6E) had a reduction of 20.9%, the neurointensive care (6F) 34.5% and the general ICUs 42.9% (6G) and 31.0% (6H) (see appendix 1, figures 4-11). Though all four ICUs displayed a decrease in total ABGs performed

by at least 20%, the cardiothoracic unit predictably had the smallest reduction due to the existing protocols that govern post-cardiac surgical patients, which mandate frequent ABGs in the first 48hrs postoperatively.

5. Striving for Best Practice

Healthcare costs are increasing at a significantly faster rate than can be accounted for by inflation, population growth and ageing. In 25 years from 1989 to 2014 health expenditure grew from \$50 billion to \$154 billion, representing an increase from 6.5% of gross domestic product to 9.7% (Australian Institute of Health and Welfare 2016).

Clinicians have a professional responsibility to utilise health resources in a just and ethical manner. Up to half of the blood tests ordered in ICU are thought to be unnecessary, including 30-66% of all ABGs performed (Merlani 2001, Melanson 2007, Pilon 1997). Reductions of over 40% have been achieved without negatively impacting patient care (Melanson 2007, Martinez-Balzano 2017, Blum 2015, Ullman 2016, Merlani 2001). There are no validated guidelines for ABG sampling and no local policies from NSW Health or The College of Intensive Care Medicine to direct ABG testing. Ordering patterns appear to be primarily driven by cultural factors (Wang 2002, Merlani 2001, Melanson 2007). Traditional practice has been to order ABGs on ventilated patients at regular intervals for "routine" monitoring, as well as after any change in ventilator settings and before or after extubation. Melanson et al found that over 60% of all ABGs were performed for these reasons; 25% for routine monitoring, 28% for a change in ventilator settings, and 8% pre- or post-extubation. Only 26% were in response to a respiratory event. In another study of critical care clinicians in a 98-bed ICU, 90% ordered ABGs for routine surveillance, 80% after every change to the ventilator, 70% pre-extubation and 65% for "convenience" when an arterial catheter was available (Martinez-Balzano 2017). The presence of an arterial catheter has been shown to be the most powerful predictor of the number of ABGs ordered when controlled for illness severity (Zimmerman 1997, Muakkassa 1990).

Due to the large burden on the healthcare system, staff and most importantly patients, and the promising results of other studies, we thought it valuable to aim to reduce the number of unnecessary ABGs in our ICU through staff education and the introduction of a clinical guideline.

The study was enrolled on the local Quality Improvement Projects Register and ethical approval waived by the local ethics committee.

INNOVATION IN PRACTICE AND PROCESS

Several studies have investigated the indications for performing ABGs in the ICU, and subsequently attempted to reduce the number of inappropriate ABGs through education and implementation of a clinical guideline (*Martinez-Balzano 2017, Merlani 2001, Roberts 1991, Pilon 1997*). This is the largest and most robust Australian study investigating the practices of ABG sampling, and consequently showing that a concise intervention can have a large effect on practice in our clinical setting.

The integration of a multidisciplinary team was essential to our success. Aside from the core three team members, eight clinical nurse champions and many other ICU doctors and nurses that provided feedback and suggestions on an ad-hoc basis, the project required input from that pathology department (regarding cost and number of ABGs), the ICU Scientific Officer (for bed-days and outcome measures) and the Hospital Scientist (for cost of consumables).

Our large-scale multifaceted approach as described above used several forms of interactive educational content which was delivered at various times to various groups of clinicians. Our ICU has a large number of clinical staff including over 220 permanent nurses plus agency and casual nurses, 15 Staff Specialists and approximately 40 junior medical officers, most of whom rotate through the ICU for between 3 and 12 months. As a consequence, we believe that the development and implementation of a guideline was the most essential component of our success and the almost \$800,000 annual savings. Very few ICUs are known to follow a clinical guideline for ABG sampling. We believe adherence to this guideline will be essential for a sustained effect.

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APPLICABILITY TO OTHER SETTINGS

There is a significant amount of misapplication of resources in the healthcare system and an increasing effort to curtail unnecessary testing, as demonstrated by the widespread international support of the "Choosing Wisely" campaign (*Critical Care Societies Collaborative 2014*). In particular, 30-60% of all inpatient laboratory testing is likely wasteful (*Zhi 2013, Miyakis 2006*) and as previously stated, approximately this proportion of ABGs are thought to be unnecessary.

The 58 beds in our ICU represent 2.4% of all adult and paediatric ICU beds in Australia and New Zealand (*ANZICS 2017*). If we assume that our institution is representative of the national average in terms of occupancy, number of ABGs performed and cost of the test, a proportional 31.3% bed-day-adjusted decrease across all of these ICUs would represent an annual saving of approximately \$33 million, 4400 litres of blood and 40 full time equivalent nurses (73,000 nurse-hours). This is not withstanding the cost of associated blood transfusions and other downstream effects of iatrogenic anaemia. The primary author intends to disseminate the results of this project locally at the 2019 Trainee Presentation Evening at Royal Prince Alfred Hospital, and globally at the 2019 World Congress of Intensive Care and with eventual publication in an internationally read critical care journal.

This project is applicable to other critical care areas such as Coronary Care Units (*Wang 2002*), the Emergency Department (*Zhi 2013*), Operating Theatre and Neonatal ICUs (*Ullman 2016*). Furthermore, the theoretical framework may be applied to other commonly used tests in hospital. Many other blood tests, microbiological tests and chest x-rays have also been found to be often ordered unnecessarily (*Prat 2009, Kobewka 2015*).

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APPENDIX

Appendix 1: Number of ABGs performed according to month and the four constituent ICU ‘pods.’ These are adjusted for occupancy and the total cost analysed.

Figure 1

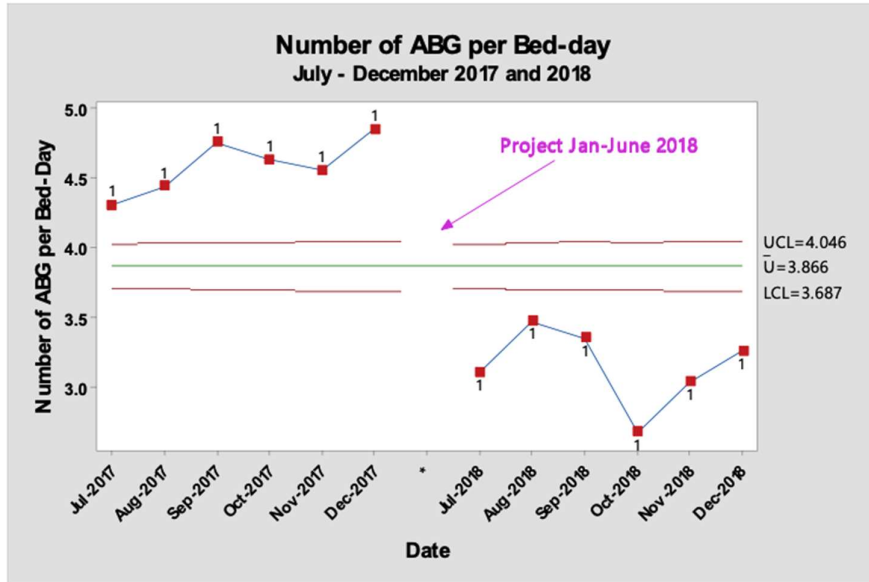


Figure 1 demonstrates statistically significant decreases in the number of ABGs per bed-day during every month in the post-intervention period, compared to pre-intervention. This is evidenced by one or more special cause variation tests (appendix 4) on the control chart being breached. It results in the summary statistics, at right, being inaccurate. This has been dealt with in figure 2.

Figure 2

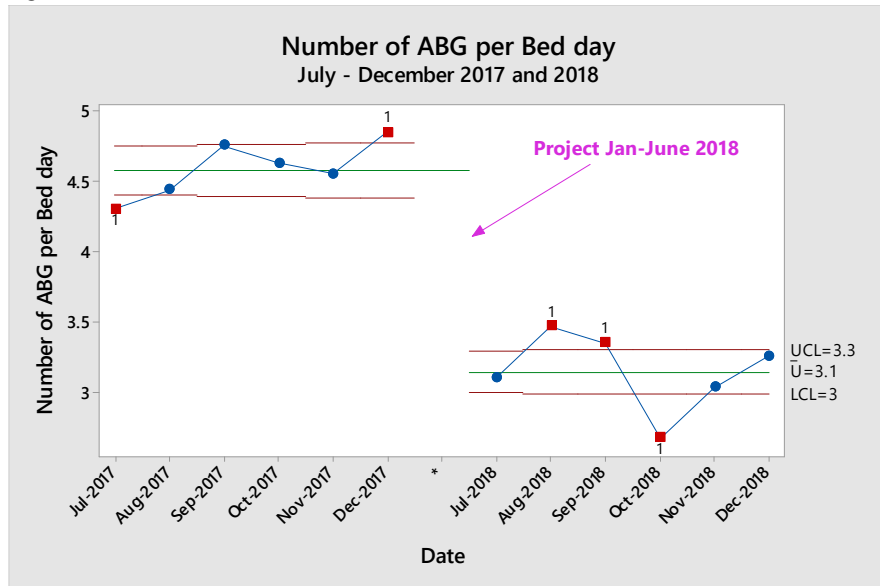


Figure 2 has split out the special cause variation in figure 1 demonstrating a statistically significant shift in performance. There has been a statistically significant decrease in the average number of ABGs per bed-day from 4.6 to 3.1, which corresponds to a statistically significant decrease in the average number of ABGs per month from 5,500 to 3,750

Figure 3

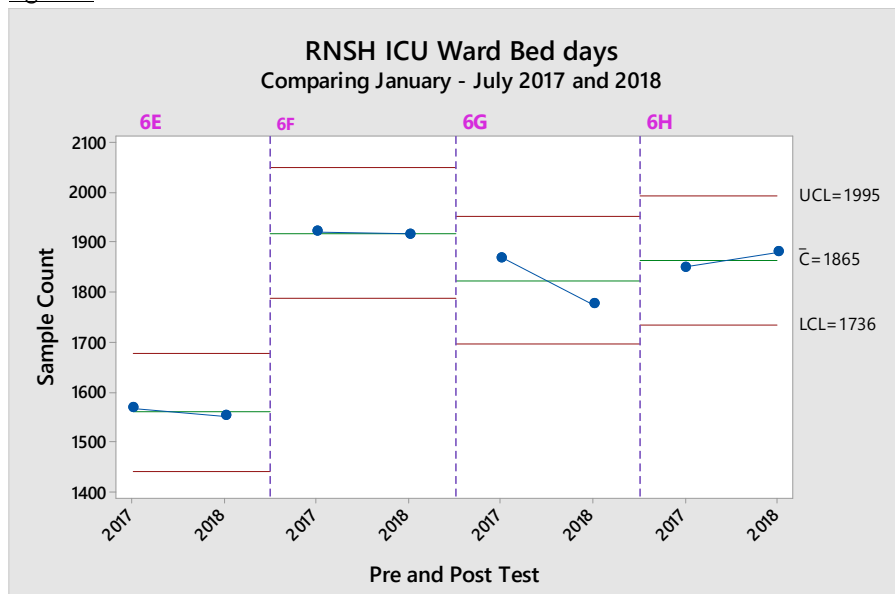


Figure 3 demonstrates that there has been no significant change in the occupancy (bed-days) in any of the four ICU 'pods' across the two study periods, with six-monthly totals averaging 1600-1920 bed-days.

It is therefore appropriate to monitor the absolute number of ABG (as staff understand these better) rather than a rate per bed-day. See figures 4-11 for a further analysis of the number of ABGs in each pod of the ICU.

Figure 4

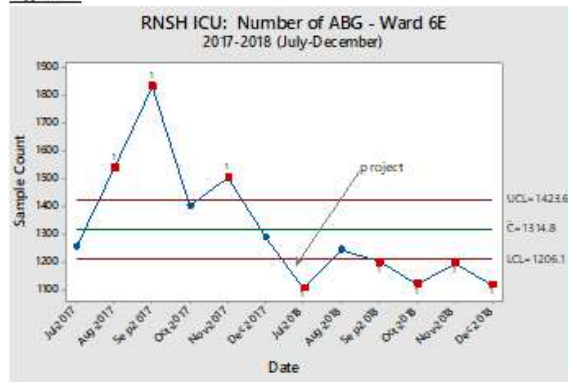


Figure 5

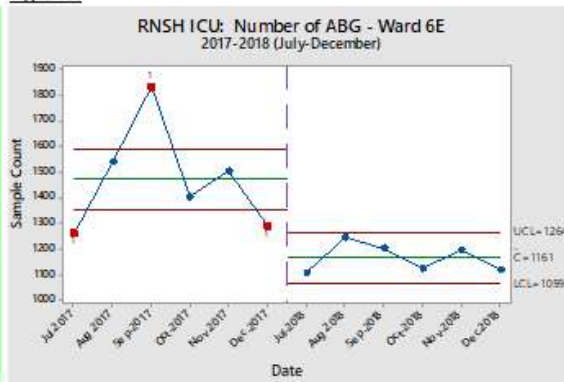


Figure 4 demonstrates multiple special cause variation (appendix 4); a statistically significant decrease in the number of ABG in pod 6E since project commencement, as analysed in figure 5. There has been a statistically significant reduction in average ABG from 1469 to 1162 per month. This is a reliable process as it is exhibiting only common cause variation.

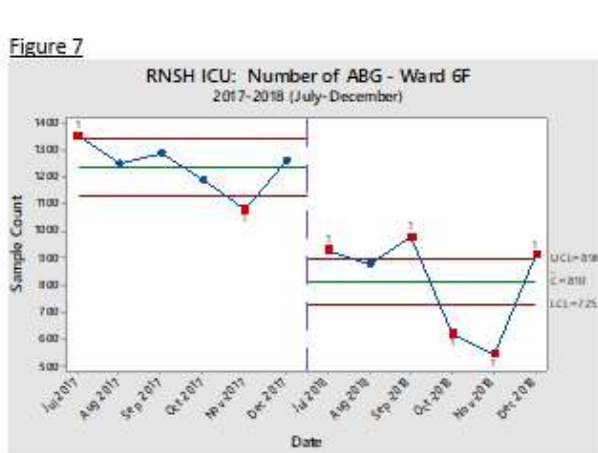
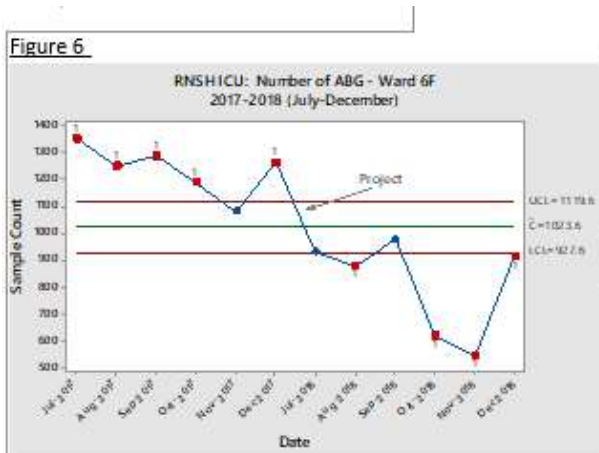


Figure 6 demonstrates multiple special cause variation (appendix 4); a statistically significant decrease in the number of ABG in pod 6F since project commencement, as analysed in figure 7. There has been a statistically significant reduction in average ABG from 1237 to 810 per month.

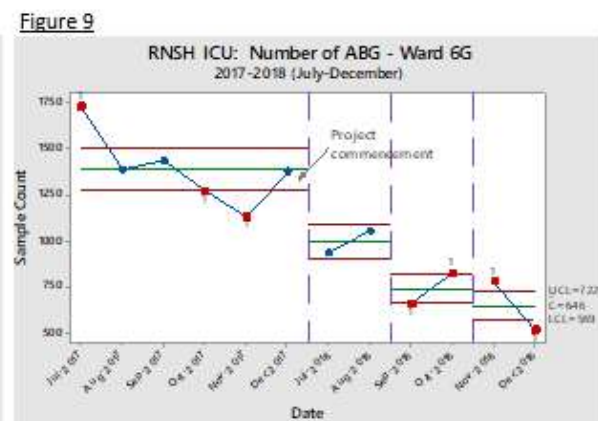
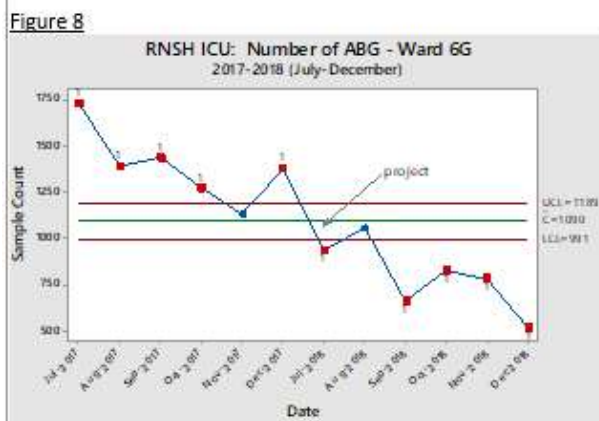


Figure 8 demonstrates multiple special cause variation (appendix 4); a statistically significant decrease in the number of ABG in pod 6G since project commencement, as analysed in figure 9. There are two further downward shifts in performance which are statistically significant. There has been an statistically significant reduction in average ABG from 1390 to 646 per month.

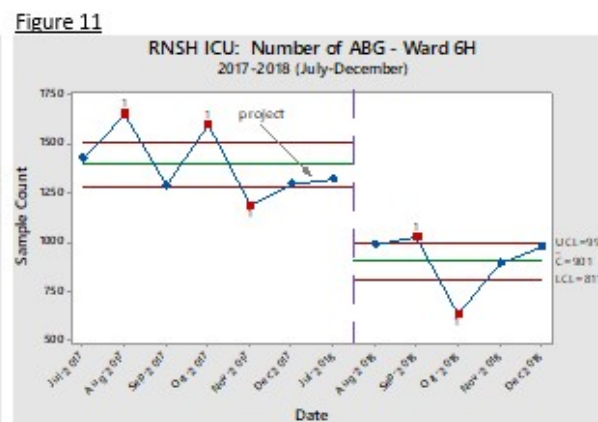
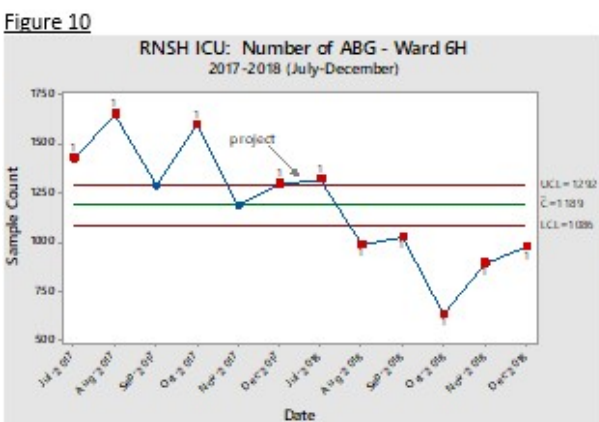


Figure 10 demonstrates multiple special cause variation (appendix 4); a statistically significant decrease in the number of ABG in pod 6H since project commencement, as analysed in figure 11. There has been a statistically significant reduction in average ABG from 1395 to 901 per month.

Figure 12

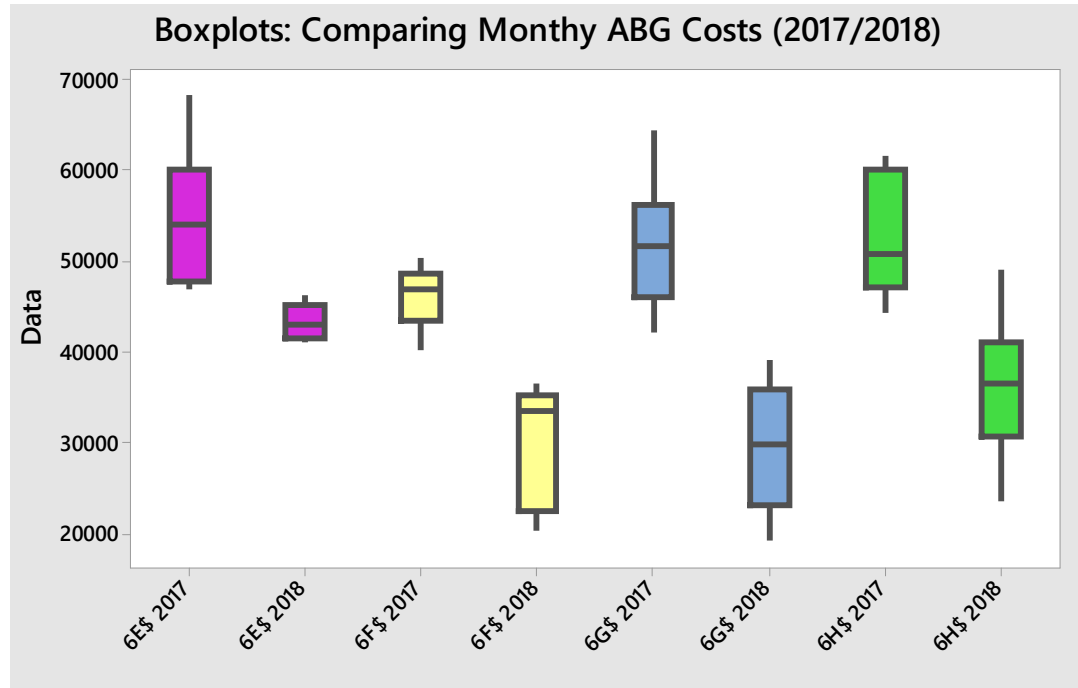


Figure 12 demonstrates the monthly expenditure on ABGs for each of the four ICU pods, comparing July-December in 2017 with 2018. All four pods achieved statistically significant cost savings as a result of this project; the average monthly cost of ABGs per pod has decreased from \$51,226 in 2017 to \$34,779 in 2018.

Appendix 2: The survey used to investigate the indications for ABGs in our ICU

Figure 13

ICU ABG Survey – 4 easy steps			
Step 1	Step 2	Step 3	
Background	Reason for ABG	Further information	
	CHOOSE ONE		
Doctor initiated <input type="checkbox"/> Nurse initiated <input type="checkbox"/>	Clinical Deterioration <input type="checkbox"/>	Please describe..	
<i>Is the patient:</i> (tick all that apply)	Guide current therapy <input type="checkbox"/>	Change in infusion <input type="checkbox"/> Change in O2 delivery <input type="checkbox"/> Change in ventilator settings <input type="checkbox"/> Other: _____ <input type="checkbox"/>	
Intubated <input type="checkbox"/> NIV <input type="checkbox"/> CRRT <input type="checkbox"/> Unstable <input type="checkbox"/> Other _____ <input type="checkbox"/>	After therapy ceased <input type="checkbox"/>	Post-extubation <input type="checkbox"/> Post-electrolyte replacement <input type="checkbox"/> Post-blood transfusion <input type="checkbox"/> Other <input type="checkbox"/>	
	Other reason <input type="checkbox"/>	Abnormal previous result <input type="checkbox"/> With formal bloods <input type="checkbox"/> Start/change in shift <input type="checkbox"/> Not done for _____ hours <input type="checkbox"/> Preparing for transport <input type="checkbox"/> Other: _____ <input type="checkbox"/>	
Step 4 - Final question			
The main reason/s this ABG is being performed is to monitor/test for? (more than one can be selected)			
BSL <input type="checkbox"/>	Acid/base/pH <input type="checkbox"/>		
Electrolytes <input type="checkbox"/>	Lactate <input type="checkbox"/>		
Gas exchange <input type="checkbox"/>	Haemoglobin <input type="checkbox"/>		

For a fortnight during both the pre- and post-intervention periods, bedside nurses were asked to complete one survey each time they processed an ABG, when clinical duties allowed. 709 were completed in July-December 2017 and 417 in July-December 2018

Appendix 3: Indications for performing ABGs in our ICU; an analysis of the surveys in 2017 and 2018

Figure 14

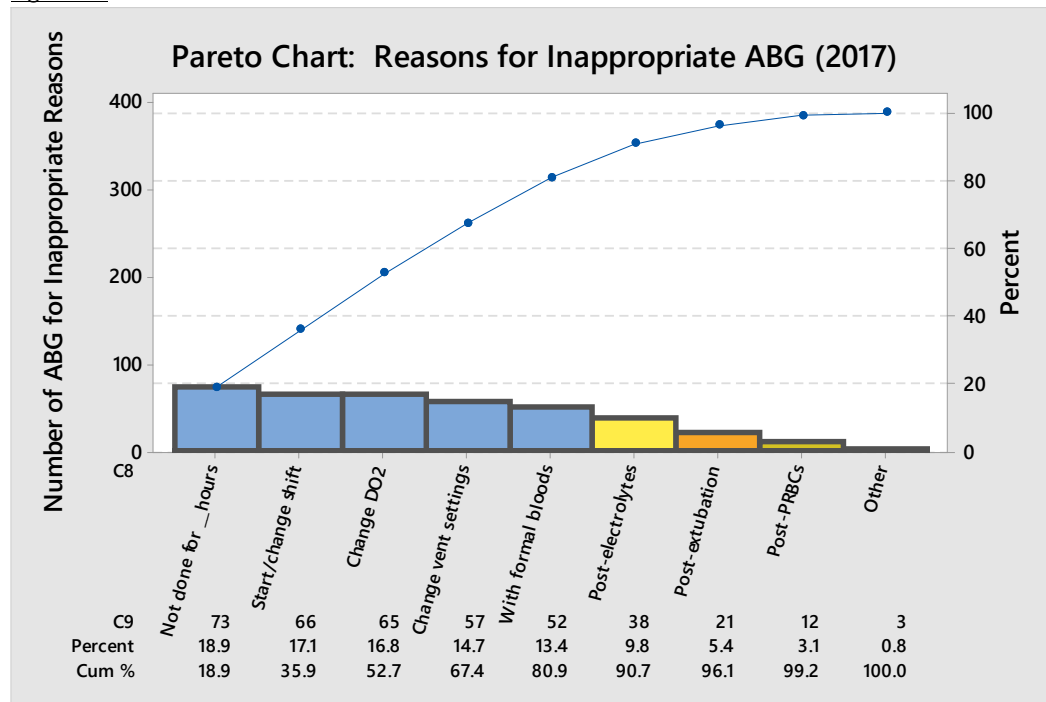


Figure 14 demonstrates the reasons for inappropriate ABG ordering. Five categories account for 80% of all inappropriate ordering and these can be broadly divided into two groups; change in oxygen delivery (DO2) or ventilator settings (see figure 16), and 'cultural reasons' (see figure 18). These were the primary targets in the intervention stage of the project.

Figure 15

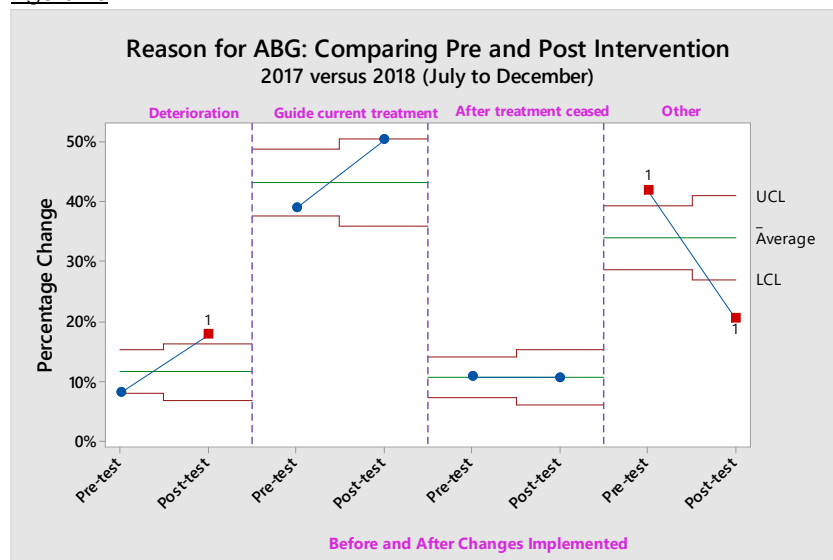


Figure 15 demonstrates statistically significant changes in two categories as evidenced by breaches of the special cause variation tests (appendix 4): an increase from 8% to 17.7% in the ordering of ABGs for clinical deterioration and a decrease from 42% to 20% for performing ABGs for reasons other than deterioration, guiding current treatment or after treatment is ceased (this category is further explored in figure 18)

Figure 16

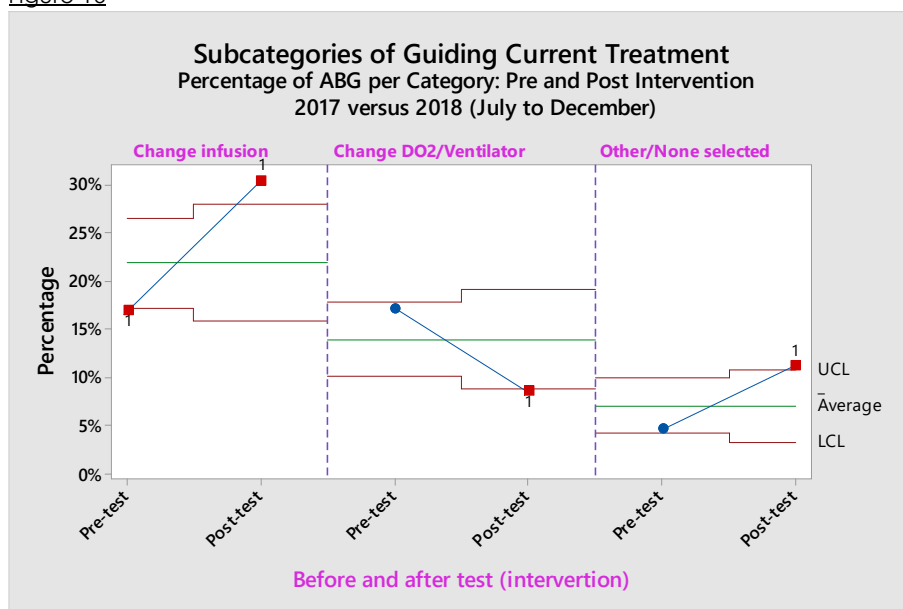


Figure 16 demonstrates statistically significant changes in all subcategories of 'guiding current treatment,' as evidenced by breaches of the special cause variation tests (appendix 4): an increase from 17% to 30% in the ordering of ABGs after a change in infusion, a decrease from 17% to 9% for changes to oxygen delivery (DO2) or ventilator settings, and an increase from 5% to 11% for other reasons/not selected.

Figure 17

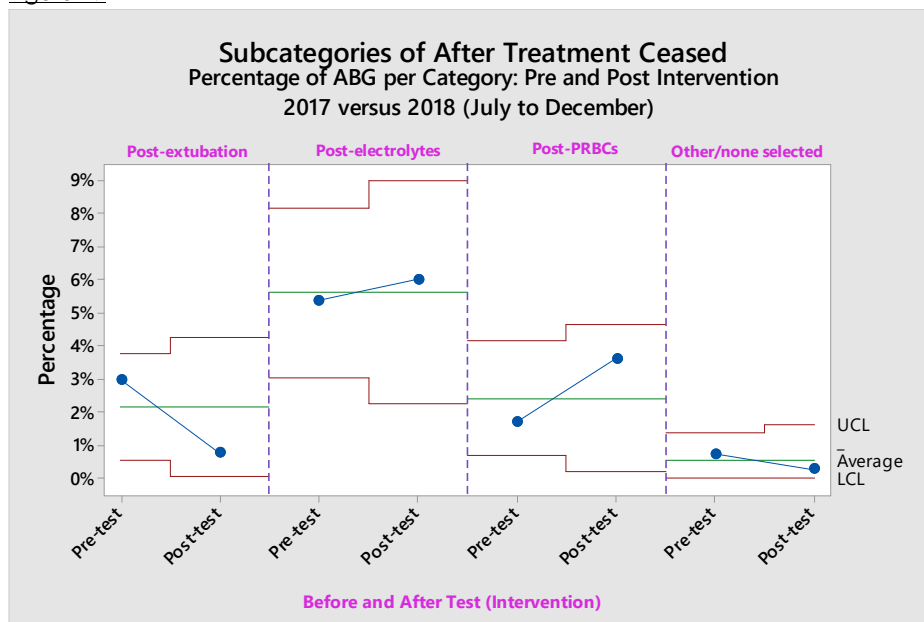


Figure 17 demonstrates no statistically significant changes for the subcategories of 'after treatment is ceased.'

Figure 18

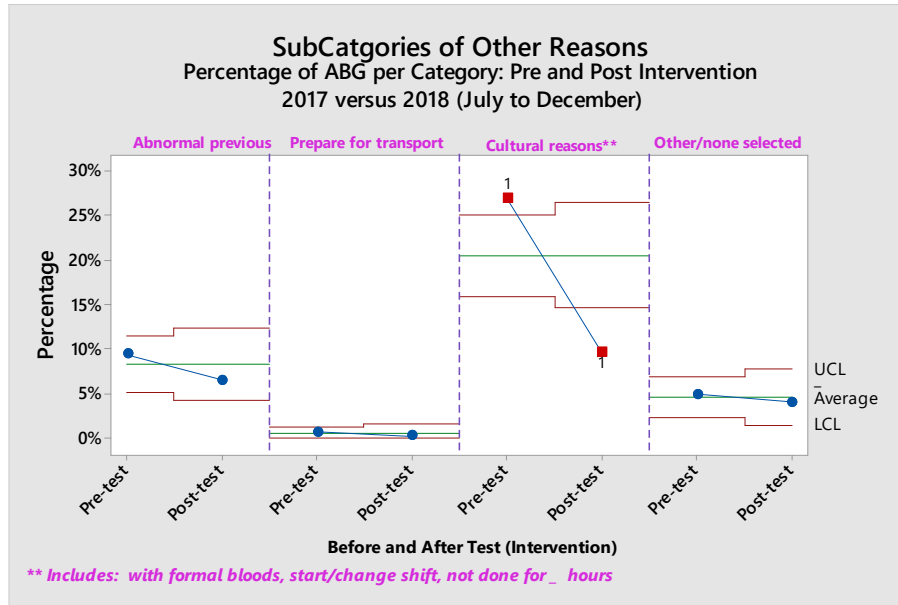
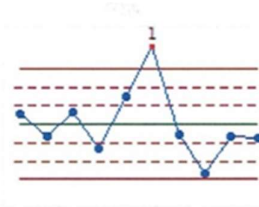


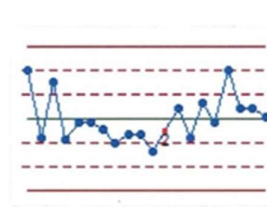
Figure 18 demonstrates a statistically significant reduction as evidenced by breaches of the special cause variation tests (appendix 4): a decrease from 26.9% to 9.7% in the ordering of ABGs for cultural reasons (ie when taken for convenience at the same time as other blood tests, at the start or change of shift, or because an ABG had not been done for several hours). There is no statistically significant difference in any other subcategories

Appendix 4: Minitab tests for special cause variation

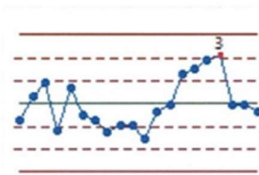
Figure 19



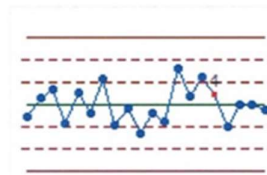
Test 1: One point more than 3σ from center line
 Test 1 evaluates the pattern of variation for stability.
 Test 1 provides the strongest evidence of lack of control



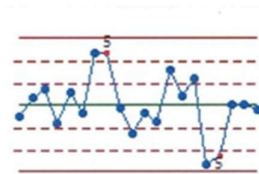
Test 2: Nine points in a row on the same side of the center line
 Test 2 evaluates the pattern of variation for stability. If small shifts in the process are of concern, Test 2 can be used to supplement Test 1 to create a control chart with greater sensitivity.



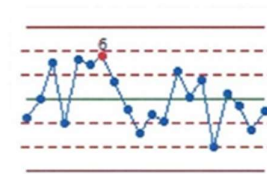
Test 3: Six points in a row, all increasing or all decreasing
 Test 3 detects a trend or continuous movement up or down. This test looks for long series of consecutive points without a change in direction.



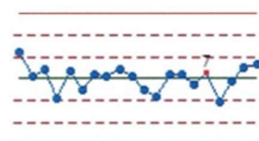
Test 4: Fourteen points in a row, alternating up and down
 Test 4 detects the presence of a systematic variable. The pattern of variation should be random, but when a point fails Test 4 it means that the pattern of variation is predictable.



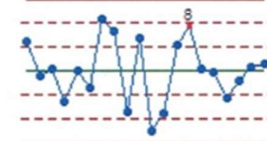
Test 5: Two out of three points more than 2σ from the center line (same side). Test 5 evaluates the pattern of variation for small shifts in the process.



Test 6: Four out of five points more than 1σ from center line (same side). Test 6 evaluates the pattern of variation for small shifts in the process.



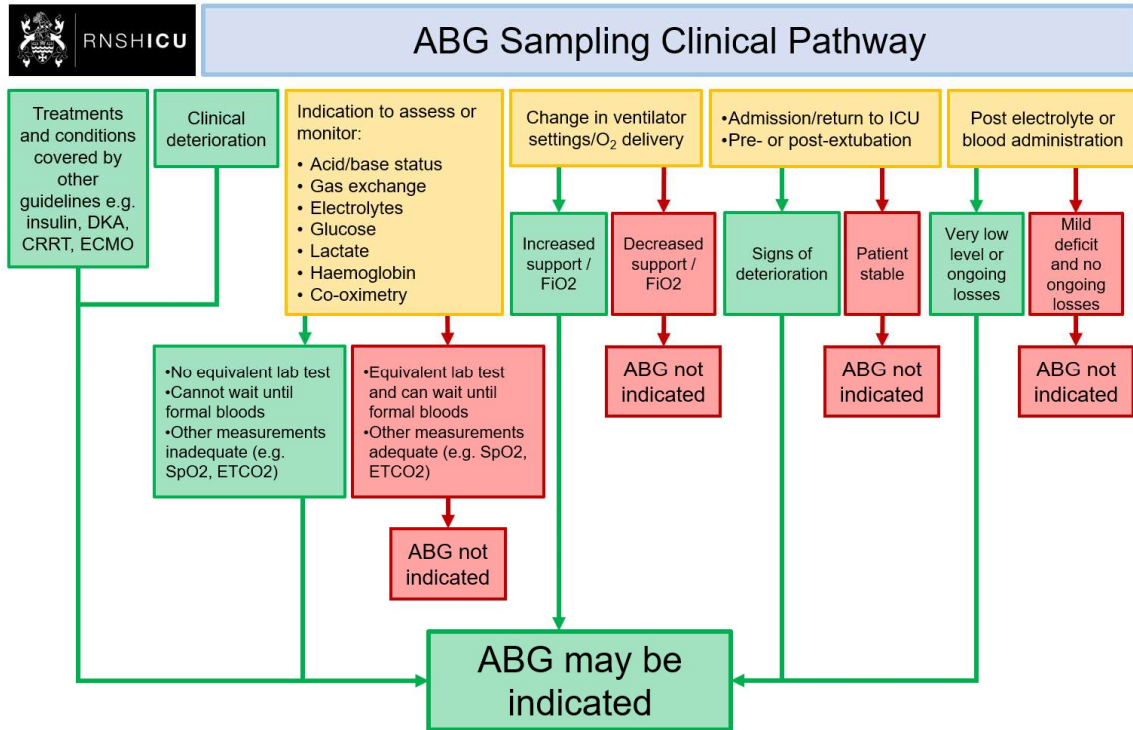
Test 7: Fifteen points in a row within 1σ of center line (either side)
 Test 7 identifies a pattern of variation that is sometimes mistaken as a display of good control. This type of variation is called stratification and is characterized by points that follow the center line too closely.



Test 8: Eight points in a row more than 1σ from center line (either side)
 Test 8 detects a mixture pattern. A mixture pattern occurs when the points tend to avoid the center line and instead fall near the control limits

Appendix 5: Clinical pathway, taken from the clinical guideline for ABG sampling that was developed as part of our intervention

Figure 20





HEALTHCARE MEASUREMENT

HIGHLY COMMENDED

Hunter New England Local Health District

Clinical Governance

Empowering patients, family, and carers for improved recognition and response to clinical deterioration

Daniel McCarthy, Mary Bond

AIM

To increase patient awareness of, and access to, a patient and family activated escalation program, and thereby improve the recognition and response to clinical deterioration.

SUMMARY ABSTRACT

BACKGROUND: Failure to recognise, respond to, and escalate care of deteriorating patients is a major contributor to adverse patient events, including cardiopulmonary arrests and unintended patient harm². Patient and family activated escalation programs that are well implemented, widely accessible, and embedded into standard practice have the potential to improve the early recognition of clinical deterioration and thereby improve patient outcomes through earlier intervention².

Patient and family activated escalation programs provide a mechanism for patients, family members, and carers to directly escalate concerns when they notice worrying changes in clinical condition. In New South Wales, the established patient and family activated escalation system for public hospitals is the Clinical Excellence Commission's REACH Program. The REACH program adopts a graded escalation approach whereby, (1) patients are encouraged to first raise concerns with their treating clinicians, (2) if they still have concerns patients can request a Clinical Review from a Medical Officer, and (3) if patients have continued concerns they can place a "REACH Call" and ask for help from a senior Clinical Manager who must respond within 30 minutes.

Hunter New England Local Health District had partially implemented the program before July 2017 however baseline evaluations indicated the programme required improvement, and implementation needed to be extended to all facilities. A district-wide evidence-based

improvement and implementation plan was subsequently developed and implemented.

METHODS: Based on the principles of clinical redesign methodology and change management, interventions to improve and spread implementation of the program were provided in four Plan, Do, Study, Act (PDSA) cycles. The interventions were applied across 39 diverse inpatient facilities including those in a major metropolitan centre, several in large regional centres, and many in smaller rural and remote communities. Key interventions were electronic audit development, staff storytelling, Short Message Service (SMS) notifications to patients on admission, community forums, webpage development, Policy Compliance Procedure enhancement, and an implementation package for managers. A pre-post evaluation design was conducted involving surveys of patients, staff, and managers via the secure SelectSurvey™ platform, auditing using an online Quality Audit Reporting System, and the use of Google Analytics data to evaluate webpage performance. Sample size was 179 patients and staff at baseline and 545 patients and staff post-implementation.

RESULTS: Patient access to the REACH Program increased by 44 percent, patient awareness increased by 10 percent, and a statistically significant improvement in overall compliance with REACH best-practice care elements was achieved increasing by 24 percent from 52 percent at baseline to 76 percent post-implementation. Statistically significant improvements were also achieved for, *improved patient understanding of REACH, the provision of REACH information flyers to patients, and the display of REACH posters in patient rooms.* Among patients activating a REACH call, 13 percent (n=5) had abnormal vital signs at the

time of their call, and 54 percent (n=21) of all calls required a change to the patient's management plan to address clinical concerns despite the presence of abnormal vital sign observations.

CONCLUSION: The improvement and implementation approach used by Hunter New England Local Health District increased patient awareness of, and access to, REACH best practice care. REACH was successful in identifying clinical deterioration in just over one in ten patients activating a REACH call, and enabled an early response to clinical concerns in just over half of all patients activating a REACH call.

HIGHLY COMMENDED**Central Coast Local Health District**

Neurosciences

Impact of a digitally enabled stroke service on KPIs and best practice metrics*Bill O'Brien, James Evans, Khaled Alanti, Lauren Wheeler***AIM**

Junior doctors, who are expected to provide acute frontline care for stroke patients, have limited initial expertise as they rotate every three months. Modern stroke care has become more complex as better treatments become available, thus the need for a decision support platform that guides them through the process of acute care within their workflow. The goal of this project was to improve the care of stroke patients by prompting junior doctors to do a targeted assessment whilst having access to in-built best practice management order sets. Secondary aims were to ensure concise but thorough documentation, to have automatic data capture as a by-product (negating the secondary work of data entry), and to enable senior doctors to have a good overview of the processes of care.

SUMMARY ABSTRACT

In 2018 approximately 4000 junior medical officers worked in the NSW Public Health system, almost 1000 of whom had not been medical officers the year before. Junior doctors, with varying degrees of experience and competency, administer the bulk of acute care, particularly in the first 24 hours, under the regular supervision of senior consultant physicians. The Neurosciences Department at Gosford Hospital introduced a Decision Support Platform (DSP) that standardises the admission, ward round and discharge processes to ensure consistent delivery of best practices by providing prompted guidance to junior medical officers. Translating best practice into routine clinical care is difficult. The DSP provides the relevant prompts to the junior medical officer as needed within workflow by digitising the Gosford departmental stroke care guide and pathway. This also facilitates the assessment to be documented rapidly by the user and provides explicit instructions to nursing and allied health for post admission care. This approach continues with a guided comprehensive structure to the ward round. Using the clinical data collected from the admission, ward rounds and discharge planning, a standardised

discharge summary covering all of the essential items is automatically created to allow concise, explicit and thorough hand over of care to the community care team.

A key feature is improved documentation. Poor clinical documentation is a well-recognised problem in hospitals throughout Australia. It leads to substandard care, reduction in funding for incompletely capturing care complexity and results in incorrect and incomplete clinical data for quality, safety and research. Prior to the DSP junior medical officers documented each interaction in free text as a new piece of work creating a huge work load as current Electronic Medical Records systems do not facilitate this process.

The DSP also assists junior medical officers with the coordination of their tasks by providing a list that includes patient location, names, primary diagnoses and issues, as well as outstanding tasks that require actioning.

As an overarching stroke service, achieving consistent best practice is challenging. Key performance indicators of acute stroke unit care have improved slowly or have not improved at all over an eight-year period nationally. The conventional method of benchmarking and data collection is time consuming and tedious. In 2007 The National Stroke Foundation implemented a biennial clinical audit of acute stroke care. This requires a staff member at Gosford Hospital to spend 30-40 hours trawling through the clinical record of a randomly selected group of 40 patients (as a representative snapshot of the 1200 or so patients managed in the previous 2 years), identifying data points necessary for the report. Often the data is missing.

The DSP gives access to real-time clinical data, allowing visualisation of the main key performance indicators of the service for each patient. The dashboard lists all acute stroke patients in the unit and at a glance provides, for example, length of stay, the degree of clinical deficits at 24 and 72 hours, and whether the patient is on appropriate medication. This

element enables senior clinicians to fix deficiencies in care in real-time. The DSP also allows for all the clinical information to be exported in a CSV format to allow for more detailed analysis and reporting.

Six months following the introduction of the platform we performed a retrospective analysis of Electronic Medical Records of patients admitted to Gosford hospital with acute stroke between June 2018 and September 2018. Over 4 months, 136 patients presented with acute ischaemic stroke and 11 patients had a haemorrhagic stroke. We examined access to the stroke unit as well as discharge on appropriate secondary preventative medications, including antihypertensives and antithrombotic therapy. Patients whose direction of care was palliative and patients with documented contraindication to secondary prophylactics were excluded. We compared the results to previous years as measured through the Stroke

Foundation audit. Stroke unit access was higher following its introduction in 2018 compared to 2017 (97% versus 76%, respectively). Similar findings were noted for patients with atrial fibrillation who received oral anticoagulants on discharge (90% versus 50%) and patients discharged on antihypertensives (95% versus 80%).

An independent assessment from the Central Coast Local Health District business unit demonstrated improvement in NWAUs (national weight activity units; units of healthcare activity where a single unit is a national adjusted price of care). This was achieved through better documentation as episodes of care and complexity were being recognised by clinical coders due to the more comprehensive documentation that resulted from the use of the DSP. Length of stay also decreased substantially. This was estimated to create efficiency gains of \$900 000 over a 9-month period.



HEALTHCARE MEASUREMENT

TABLE OF SUBMISSIONS

<p>King Edward Memorial Hospital Women and Newborn Health Service King Edward Memorial Hospital - Department of Pharmacy; Collaborator: WA North Metropolitan Health Services - Business Intelligence & Performance The Safety Dashboard- Using Business Intelligence tools to improve Medication Safety <i>Stephanie Teoh, Michael Petrovski, Jane Mamas</i></p>
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WINNER

National Critical Care and Trauma Response Centre

Clinical Governance Group

Establishing a New National and International Benchmark - A Unique Application of the ACHS EQUiP6 Quality Improvement Framework to Australia's National and International Deployable Health Emergency Capability

Dr Dianne Stephens, Jane Thomas

AIM

The Aim of the Project was to establish a quality improvement framework for the National Critical Care and Trauma Response Centre (NCCTRC) deployable capability to ensure delivery of the highest standard of care to the vulnerable populations we serve during disaster response.

SUMMARY ABSTRACT

The NCCTRC is the Australian Government's health emergency response capability tasked with ensuring the workforce and equipment required for a national and international medical response are prepared, equipped and ready to deploy whenever required. The NCCTRC is the custodian of the Australian Medical Assistance Team (AUSMAT) capability. The AUSMAT capability achieved World Health Organisation (WHO) verification as a Type 1 and Type 2 Emergency Medical Team (EMT) capability in 2016. The WHO verification occurs against a set of minimum standards applied globally.

In 2017, under the direction of the Medical Director, a formal clinical governance system including a Clinical Governance Framework and Committee was established. The committee decided that formal national accreditation of the deployable capability would enhance the quality of care provided and guide ongoing improvement of patient outcomes in the disaster setting.

The NCCTRC Executive agreed to explore a quality framework that would elevate the organisation's quality improvement process beyond the WHO minimum standards and aim to apply Australian Council of Health Care

Standards (ACHS) to our unique field capability setting. In August 2017 an ACHS scoping visit was undertaken by senior ACHS surveyors to determine the framework that would apply to this unique capability. The EQUiP6 Framework was chosen as it provided the flexibility to accommodate the complexity of a deployable health facility, the fixed and virtual workforce we manage and the application of disaster response / humanitarian principles to our work.

The NCCTRC joined the EQUiP6 program in May 2018.

The process of self-assessment identified gaps in our surveillance and audit programs that required innovative adaptation of existing hospital based tools to the field hospital / disaster response setting. New tools were developed for auditing medical records, medication safety, hand hygiene, pressure injury and falls risk in the field hospital setting. A new incident reporting form was developed to incorporate safety and security risk reporting in addition to clinical incident reporting. The principles applied to all the tools developed included simplicity, outcome improvement focused, easy to incorporate into daily activities in the field where staff and time resources are limited. The self-assessment process identified a deficit in documentation of processes and policies and led to an ongoing program of improvement in formal documentation of what we do. The self-assessment identified the AUSMAT clinical guidelines required a formal review process and to be more accessible to the fixed and virtual workforce and a clinical guidelines project is in progress to achieve this outcome.

The NCCTRC underwent organisation wide survey in June 2019 and achieved a successful outcome. All applicable criteria achieved Marked Achievement with several criteria achieving Extensive Achievement and one criterion achieving Outstanding Achievement.

The application of a national accreditation framework to a deployable EMT capability is unique not only within Australia but on the international stage. Humanitarian organisations delivering health care in the field for many years do not have a quality improvement framework in place. The NCCTRC has demonstrated it is possible to apply a quality improvement framework to a deployable field capability and provide a standard of care that meets national health facility accreditation criteria. The EQUIP6 framework applies a more detailed clinical and corporate quality framework to the EMT capability than the WHO verification standards. The tools and processes that the NCCTRC has put in place will be shared with the global EMT community and set a new standard for clinical quality in the field.

REPORT

APPLICATION OF ACHS PRINCIPLES

1. Consumer Focus

The NCCTRC deploys AUSMAT to respond to vulnerable populations requiring health support following a disaster. The project to set a benchmark for a quality improvement framework to apply to our response capability brings the focus of disaster response back to the vulnerable populations we serve. It is our philosophy that even in the chaos of disaster the population deserves the best quality clinical care that it is possible to provide.

Tools developed include:

New patient observation chart to include an early warning system for deteriorating patients adapted to the field hospital setting

Pressure injury and falls risk assessment and management tools adapted for the field hospital setting

Patient, family and local staff satisfaction audit tool adapted to vulnerable population in disaster setting.

2. Effective Leadership

The NCCTRC sponsored and contributed to the development of the WHO EMT minimum standards first published in 2013. These standards set a new benchmark for global EMT response. The application of the EQUIP6 framework to the field setting goes beyond the EMT minimum standards to recognise that good quality care is

as important in the disaster setting as it is in our daily work in the health care system. National accreditation is a new focus for the global EMT community and the NCCTRC is a well respected international member of this community – our lead will provide a new bench mark for other teams to aspire to.

3. Continuous Improvement

The EQUIP6 framework is an ongoing cycle and the work continues through our clinical governance group to complete current projects, implement recommendations from Surveyors and find new ways to innovate to bring the quality improvements from the health system setting into the disaster response setting.

Tools and Audit cycles have been adapted to the field hospital / deployed / disaster setting for:

- Hand hygiene compliance
- Patient identification processes
- Clinical Handover processes
- Medical record documentation
- Medication safety
- Incident reporting
- Current projects ongoing:
- Clinical guidelines review and improved accessibility to the fixed and virtual workforce through an online platform
- Developing system for ongoing credentialing of virtual workforce

4. Evidence of Outcomes

The successful accreditation survey demonstrates it is possible to apply quality improvement tools and processes using the EQUIP6 framework to the AUSMAT deployable / disaster setting.

The WHO EMT initiative, the International Federation of Red Cross and Red Crescent Societies and several other global partners have followed the progress of this project and expressed interest in applying our learnings to other teams and settings.

5. Striving for Best Practice

The NCCTRC has an important place in the WHO global EMT movement. We were one of the first teams to undergo WHO verification and have provided mentors to teams throughout the world to help them achieve verification. Our lead is respected within the global community and we have a responsibility to continually strive to improve to what we do and provide an example for the global community. We are strongly committed to providing the best quality of care possible to the vulnerable populations we serve in the disaster setting and by setting ourselves the goal of ACHS accreditation and embracing the EQUIP6 Quality Improvement Program we have set a new benchmark for the

global EMT community. The NCCTRC has moved beyond WHO minimum standards to embrace best practice possible for the deployable / disaster setting.

INNOVATION IN PRACTICE AND PROCESS

A national accreditation process has not previously been applied to a deployable / disaster response health capability. The NCCTRC has adapted tools used within the health system to the disaster setting to elevate the quality of clinical care provided to the vulnerable populations we serve. A suite of clinical tools aimed at improving care has been developed and adopted into the field hospital

setting. This innovative approach to disaster response medicine raises the benchmark for other global teams and provides the first ACHS quality assured national response capability for disasters within Australia.

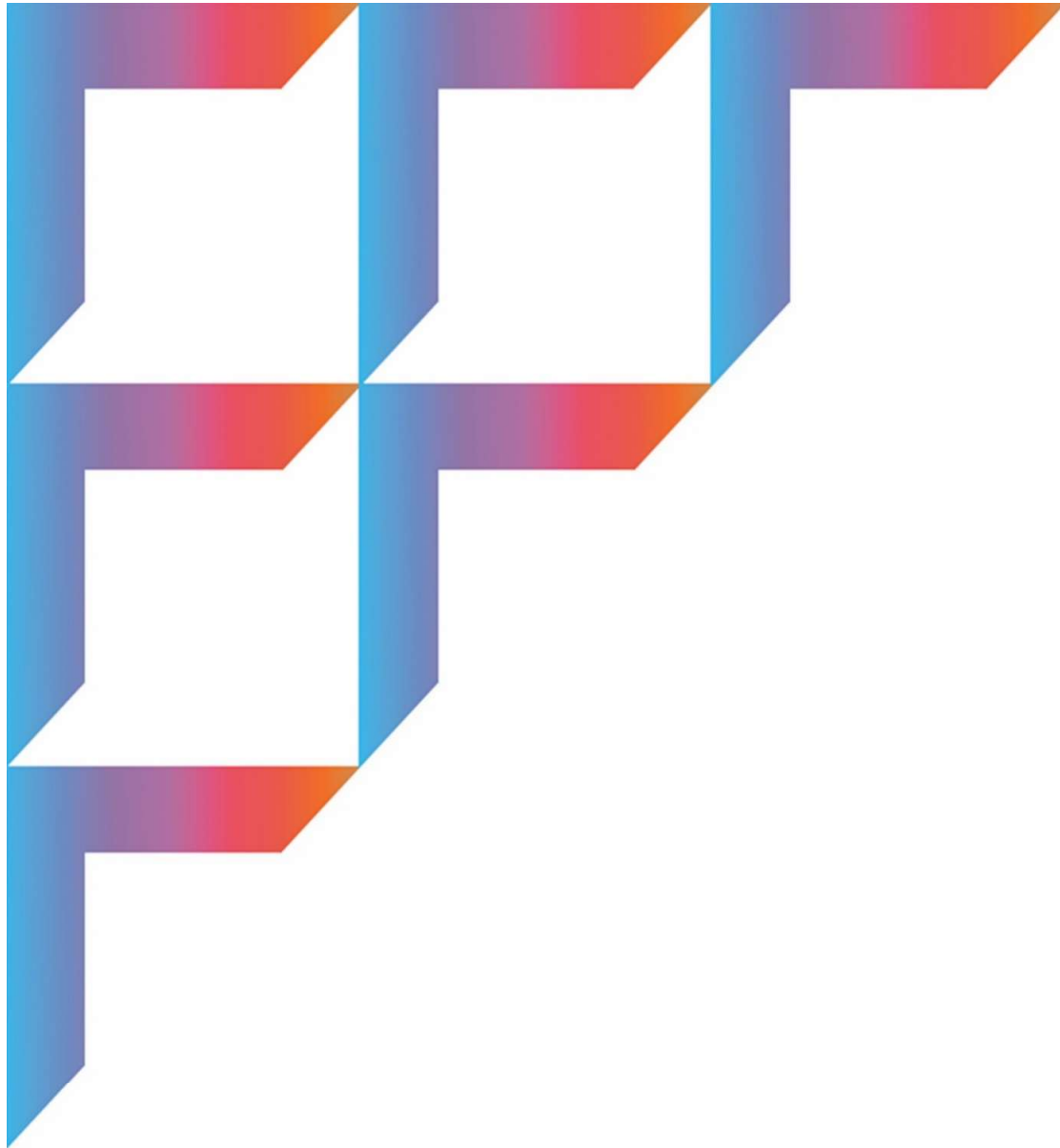
APPLICABILITY TO OTHER SETTINGS

This accreditation process and the adaptation of a quality improvement framework to the field hospital and deployable health capability will set a new benchmark for clinical quality standards for national and international Emergency Medical Team and health disaster response capabilities.

2. WHO FMT Classification Minimum Standards, Sep 2013

REFERENCES

1. EQUIP6 Accreditation Process Guide Jan 2017, ACHS EQUIP6 Book 1 and 2 Final 2016



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