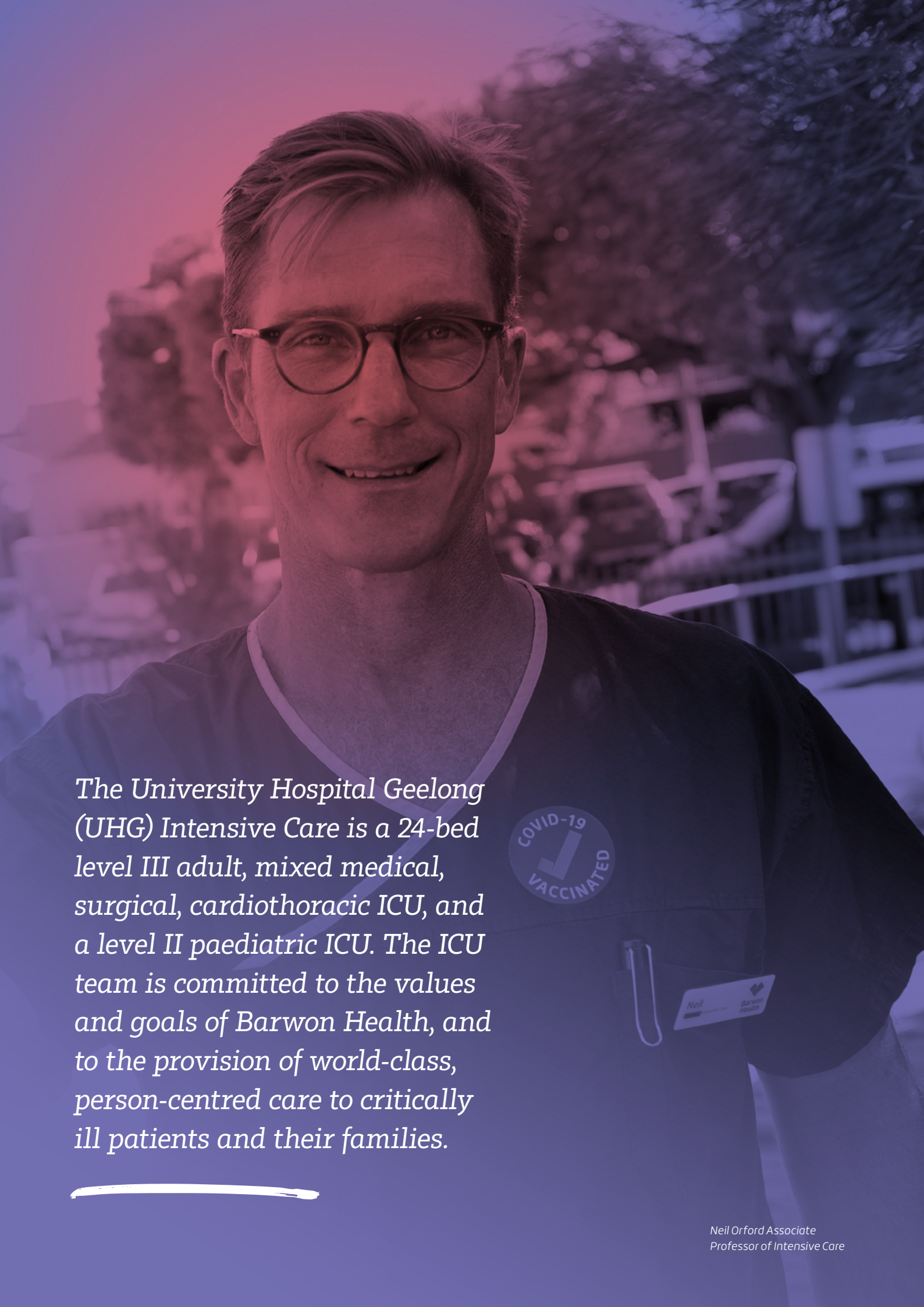


Biennial report

2020-22

University Hospital Geelong
Intensive Care Unit





The University Hospital Geelong (UHG) Intensive Care is a 24-bed level III adult, mixed medical, surgical, cardiothoracic ICU, and a level II paediatric ICU. The ICU team is committed to the values and goals of Barwon Health, and to the provision of world-class, person-centred care to critically ill patients and their families.

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Summary

The University Hospital Geelong (UHG) Intensive Care Unit is a 24-bed level III adult, mixed medical, surgical, cardiothoracic ICU, and a level II paediatric ICU. The ICU team is committed to the values and goals of Barwon Health, and to the provision of world-class, person-centred care to critically ill patients and their families.

The recent two years have been a challenging time in healthcare, with major demands due to the COVID-19 pandemic impacting on all areas, and particularly the ICU during the Delta wave. During the peak of the Delta wave, we bolstered our resources to increase our capacity to both admit more patients and provide more ECMO support. We continue to live with the pandemic, and as healthcare workers, we have been wearing N95 masks continuously and keeping up with the current public health guidelines.

Summary 2020 – 2022

- 1. Activity:** Whilst overall admission numbers have dropped, there has been an increase in ventilation hours.
- 2. Safety and quality:** We continue to provide safe and effective care and compare well to similar units.
- 3. Financial:** Costs remain stable and the budget favourable. COVID costs were accounted for in the budget.
- 4. COVID:** We provided care for 81 patients with COVID during this time and were able to increase capacity to 21 ICU equivalents.
- 5. Culture and leadership:** Senior nursing and medical staff continued to develop their leadership skills, which were put into good use during the pandemic.
- 6. Multidisciplinary care:** We are fortunate to have highly skilled and motivated allied health staff who strive to deliver excellent patient care within the ICU.

7. ECMO: The COVID pandemic challenged us to the busiest ECMO period ever, where we had seven patients on ECMO in the unit at the one time.

8. Paediatrics: We provide care for paediatric patients in south-western area of Victoria.

9. Research: The commencement of our own \$1.9M MRFF funded study, led by A/Prof N Orford, was a highlight.

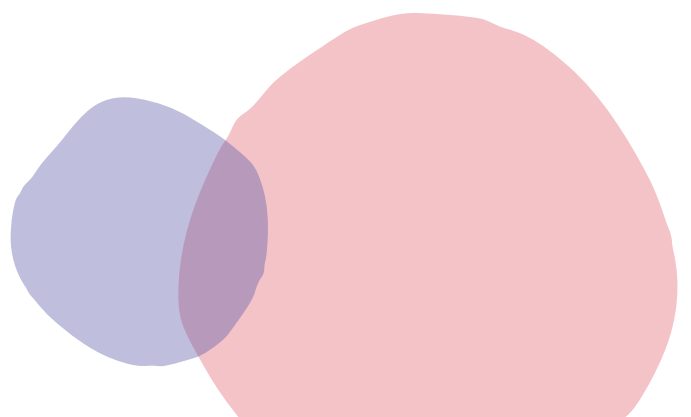
10. Person centred care: We continue to strive for true person-centred care.

11. Outreach and Rapid Response Team: With nearly 3000 calls per year, and expansion to Youang Surgery Centre, we have been able to increase our nursing and medical resources.

12. Organ Donation: We have provided the option of organ donation for more of our patients, in keeping with their wishes.

13. Education – Medical: We continue to provide a variety of medical education including SuperSIMS, Journal Club, and exam support for trainees.

14. Education – Nursing: Our nursing education team has been industrious during this time as we have focused on training for our new equipment, training for COVID patient care, increasing our postgraduate nurse intake and the commencement of the discovery nurse program.



ICU Activity

Overall admissions have decreased in the previous two years, but total ICU hours of care remain stable.

Of note, there was a significant increase in ventilation hours in 2021/22 which relates to the Delta wave of COVID.

The proportion of patients remains relatively stable, with a negative impact on elective surgical admissions due to reallocation of resources during the pandemic.

	2017/18	2018/19	2019/20	2020/21	2021/22
Funded beds	17	17	17	17	17
Admissions	1508	1735	1649	1595	1371
Total ICU hours	107764	134112	121676	128673	132152
APACHE III	55.9	54.7	56.2	49	51
Occupancy (%)	71	90	82	84	89
Ventilation hours	37552	51842	42800	47732	64475

Emergency admissions	1104	1292	1231	933	734
Elective admissions	429	442	417	662	637
Readmissions	35	75	60	68	50

Admission category

Cardiothoracic	297	306	345	409	359
Surgical	355	474	465	464	326
Medical	742	817	756	632	585
Unspecified					24
Paediatric	114	138	83	90	77
<i>Paediatric ventilated</i>	10	14	11	13	7

Admission source

ED	515	568	540	510	454
OT	583	696	701	736	580
Ward	240	340	289	262	223
Retrieval	188	127	103	87	115

Outcomes

Died in ICU	92	86	95	85	121
Death %	6.00	4.96	5.76	5.33	8.83
Afterhours discharges	97	154	166	155	184
Transfers to other hospitals	18	32	35	26	23

Rapid Response Calls (MET and CODE BLUE)	2310	2359	2527	2969	2966
RRT resulting in ICU admission	188	280	217	189	190
Tunneled lines	454	393	396	409	318

Safety and Quality

Our ICU Safety and Quality program oversees a wide range of data collection, submission to healthcare registries, analysing and presenting parameters of safety and quality, and supporting health care improvement projects. Data is regularly presented to the department by the ICU safety and quality team.

Mortality

Over the past two years, there has been an increase in mortality and the standardised mortality ratio. This trend has been illustrated in exponentially weighted moving average (EWMA) plots of mortality over time (**Figure 1**). Standardised mortality remains within the expected range compared to other tertiary centre ICUs (**Figure 2**). A small number of patients are admitted each year to ICU with mutually agreed limits to their ICU treatments, in keeping with patient-centred care values.

	2020/21	2021/22
Mortality		
Died in ICU	85	121
ICU mortality	5.33%	8.83%
Predicted hospital mortality	8.9%	11.2%
Observed hospital mortality	8.8%	12.7%
Standardised mortality ratio (95% CI)	0.94 (0.78 - 1.11)	1.09 (0.93 - 1.26)
APACHE-III, median score [IQR]	49 [38 - 66]	51 [38 - 60]
Treatment Plan on Admission to ICU		
Full treatment, n (%)	1,468 (92)	1,243 (91)
Limited treatments	118 (7)	121 (9)
Palliative care	7 (<1)	1 (<1)
Considering organ donation	2 (<1)	6 (<1)
<i>excludes paediatric admissions</i>		

Figure 1: Standardised mortality plotted over time on an exponentially weighted moving average (EWMA) chart.

ANZROD EWMA CHART

This report for University Hospital Geelong ICU (Tertiary, CICM Level 3/PICU) shows admissions to ICU between Jul 2020 and Jun 2022. **Report generated on 28/04/2023 and based on Adult Patient Database (APD)**

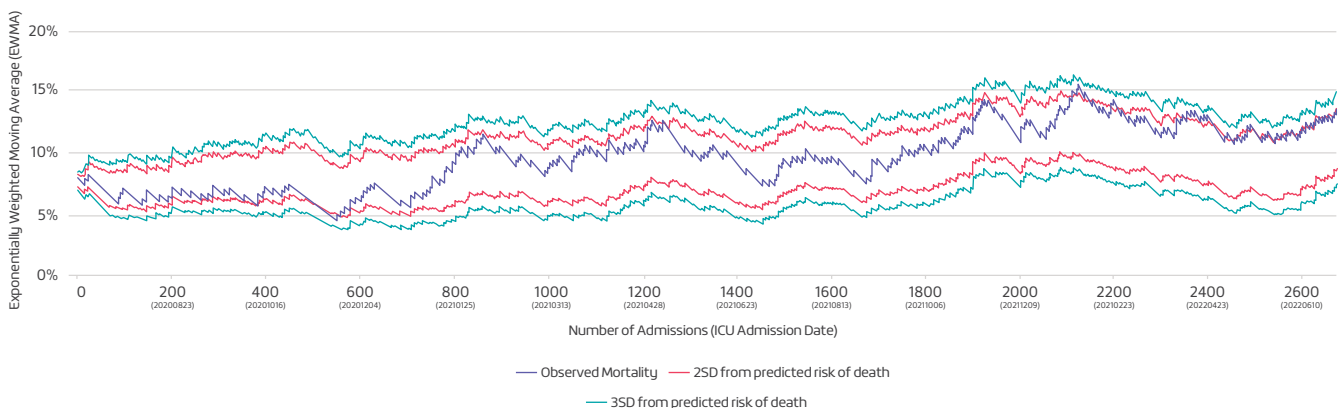
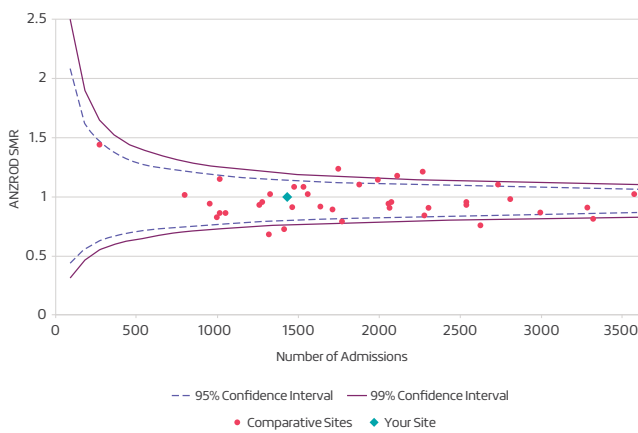


Figure 2: Funnel plot based on the Australian and New Zealand Risk of Death (ANZROD) Model Standardised Mortality Rate (SMR).

ANZROD Funnel Plot showing Standardised Mortality Ratios

This report for University Hospital Geelong ICU (Tertiary, CICM Level 3/PICU) compared to tertiary hospitals shows admissions to ICU between Jul 2020 and Jun 2021.

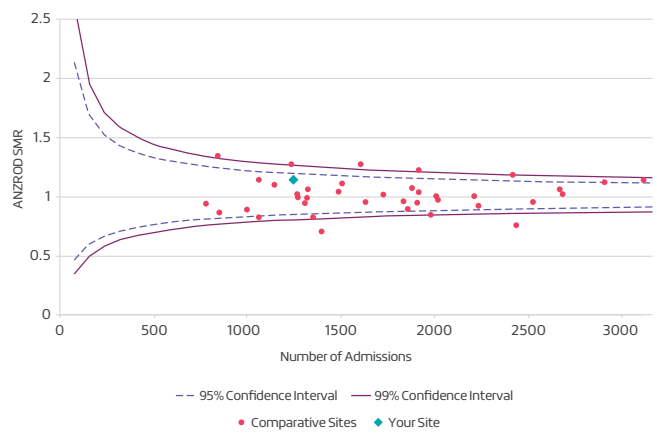
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ANZROD Funnel Plot showing Standardised Mortality Ratios

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Report generated on 28/04/2023 and based on Adult Patient Database (APD)



ICU treatments provided

Approximately half the ICU patients were mechanically ventilated, and half received vasoactive medications. Less than 10% were commenced on renal replacement therapy.

		2020/21	2021/22
Mechanical ventilation	n (%)	742 (47)	695 (51)
	hours (%)	48,153 (37)	64,693 (49)
Inotropes /vasopressors	n (%)	708 (44)	688 (50)
	hours (%)	13,961 (11)	12,044 (9)
Tracheostomy	n (%)	27 (2)	40 (3)
	hours (%)	1,916 (1)	11,252 (9)
ECMO	n (%)	11 (1)	23 (2)
	hours (%)	1,916 (1)	11,252 (9)

ICU efficiency

	2020/21	2021/22
Peak daily occupancy, median [IQR]	84% [76 – 92]	89% [81 – 97]
Proportion (%) of days with >100% occupancy	26/257 (10)	58/363 (16)
ICU length of stay, days, median [IQR]	2.0 [1.0 – 3.8]	2.1 [1.1 – 4.1]
Number of patients with ICU length of stay greater than 7 days, n (%)	152 (10)	162 (12)
Hospital length of stay, days, median [IQR]	9.1 [5.2 – 15.9]	9.3 [5.5 – 15.7]
Number of patients waiting more than 12 hours for a ward bed, n (%)	282 (18)	213 (16)
ICU hours waiting a ward bed, n (%).	13,885 (11)	11,379 (9)
Readmission to ICU during same hospital admission	68 (4)	50 (4)

The number of staffed ICU beds and current patient numbers are reported at least twice a day on a national ICU monitoring website (CHRIS). This provides oversight of ICU capacity to assist planning where patients may need to be transferred according to bed availability. Over the past two years, there has been an increase in the proportion of ICU beds occupied with patients, and approximately once per week our ICU was at or over capacity to admit patients. Maintaining some ICU capacity is required to admit unexpected critically ill patients (e.g. following a cardiac arrest).

ICU and hospital length of stay has increased slightly. This is also represented in plots of risk-adjusted ICU length of stay (**Figure 3**). The duration of time in ICU incorporates time spent waiting for a ward bed to become available.

Approximately 10% of ICU patients have a 'long-stay' (>7 days). A multi-disciplinary forum has been established to comprehensively review a 'long-stay' ICU patient each week.

Discharge delay ('exit block') continues to be an issue. Approximately 10% of ICU hours are managing patients waiting to be transferred to a ward bed. This delay is reflected in crude and risk-adjusted ICU length of stay.

The proportion of patients readmitted after ICU discharge is relatively low compared to other tertiary hospitals (**Figure 4**).



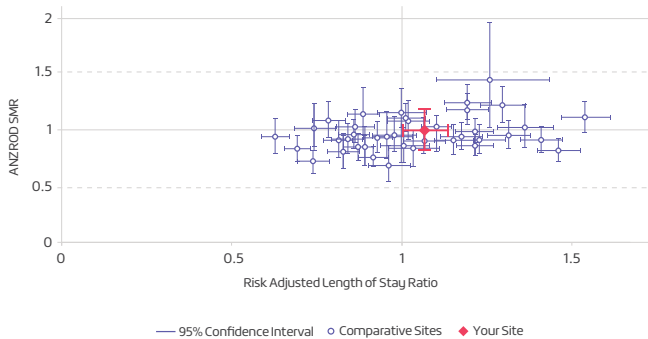
Artwork titled 'Colours of Country' by artist Ammie Howell, proud Arrernte woman. Pictured with NUM Donna Robertson.

Figure 3: ICU efficiency plots.

Efficiency plot: SMR vs risk adjusted length of stay

This report for University Hospital Geelong ICU (Tertiary, CICM Level 3/PICU) compared to tertiary hospitals shows admissions to ICU between Jul 2020 and Jun 2021.

Report generated on 28/04/2023 and based on Adult Patient Database (APD)



Efficiency plot: SMR vs risk adjusted length of stay

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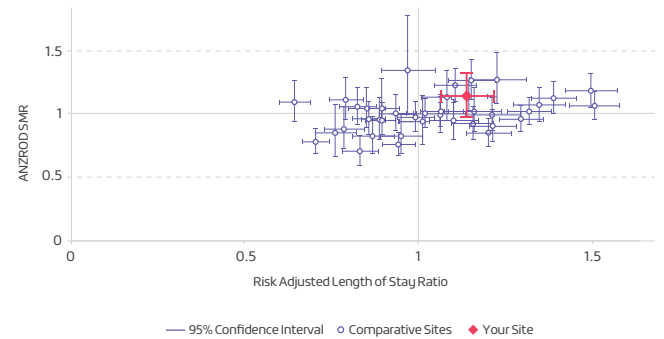
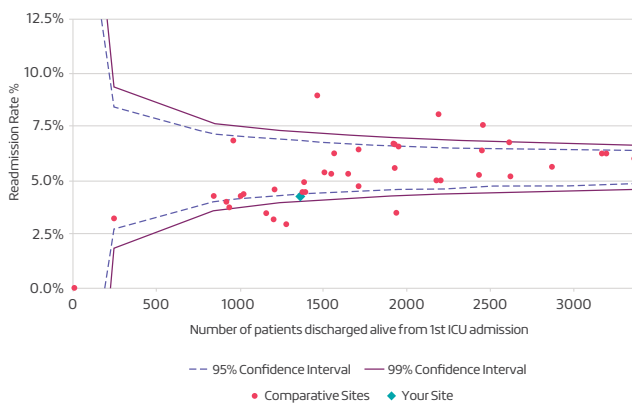


Figure 4: Funnel plot of readmission rate to ICU.

Readmission Funnel Plot

This report for University Hospital Geelong ICU (Tertiary, CICM Level 3/PICU) compared to tertiary hospitals shows admissions to ICU between Jul 2020 and Jun 2021.

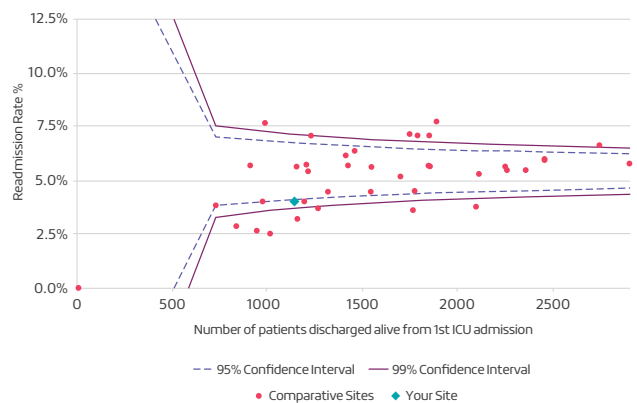
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Readmission Funnel Plot

This report for University Hospital Geelong ICU (Tertiary, CICM Level 3/PICU) compared to tertiary hospitals shows admissions to ICU between Jul 2021 and Jun 2022.

Report generated on 28/04/2023 and based on Adult Patient Database (APD)



Infection Control

(Data from 2021/2022)

- › No episodes of central line associated blood stream infections (CLABSI) in 4077 device days.
- › 14 cases of multi-resistant organism transmission: C difficile (5), VRE (1), ESBL (3), CPE (3) and MRGN (2).
- › Hand hygiene compliance was under target at 77% overall.

Risk events

Falls

- › There were 7 patients falls reported in 2020/21, and 8 in 2021/22, a slight increase from previous years.

Medication errors

	2020/21	2021/22
Administration	76	49
Prescribing	20	9
Security	7	10
Adverse reaction	1	2
Preparation	5	3
Paediatric	2	1
Other	8	6
TOTAL	119	80

- › Medication risk events continued to be reported, with a slight downtrend. Reassuringly, there was no harm done to patients with any of these errors. A medication safety group ensures risk events are addressed.

Pressure injures (2020/21, 2021/22)

- › Number of patients: NA, 73
- › Number of pressure injuries (PI) reported: 100, 114.
- › Stage 1 (36, 51), Stage 2 (54, 55), Stage 3 (nil, 2), Unstageable (10, 6)
- › Although PI still occur, the vast majority are early-stage injuries that are detected quickly and managed to prevent further deterioration. The proportion of patients with a serious pressure injury (Stage 3 / unstageable) is markedly lower than that reported in international case series (Labeau et al, ICM, 2020).

Occupational Health and Safety (2020/21, 2021/22)

- › Episodes of occupations violence and aggression: 44, 46
- › Staff injuries: 41, 46
- › Body fluid exposures: 13, 7
- › Near miss: 15, 14
- › Exposure to infectious diseases: 10, 10

Patient reported outcomes / experiences

Feedback (2020/21, 2021/22)

- › Compliments: 59, 34
- › Complaints: 15, 13

ICU Safety and Quality staff

Kylie Lakey
 Clare Lyon
 Amanda McGrath
 Lauren Baulch
 Matthew Maiden

Financial Performance

	2017/18	2018/19	2019/20	2020/21	2021/22
Funded beds	17	17	17	17	17
Admissions	1508	1748	1649	1595	1371
Total ICU hours	107764	134112	121660	128673	132152
Actual Spend	22,744,023	24,903,151	27,515,702	27,593,075	29,647,610
UHG ICU cost (\$/hr care)	223	185	240	214	224
METS/CODES	2310	2359	2527	2955	2976


The cost per hour of ICU care remains stable. There were some savings in costs across labour and non-labour categories, and the Unit was under budget at end June 2022. Standard labour costs were underbudget, whilst overtime costs were unfavourable. Non-labour costs were favourable for pharmacy, supplies, pathology, and imaging.

There were COVID-19 costs that were able to be accounted for and funded under a COVID cost centre. Equipment had been purchased in the previous financial year with COVID-19 equipment allocation by the government. Given the complexity around redeployment, and other COVID costs, it is uncertain whether this is truly representative.

Costs associated with Rapid Response team (METS/CODE BLUES) are not fully accounted for within the hourly costs above. There remains high activity and resources required to provide this service.



COVID Pod
 Director Dr Claire Cattigan and
 Acting NUM Carolyn Booth

A photograph of two healthcare workers, likely nurses, standing in a clinical setting. They are wearing dark-colored scrubs, white surgical masks, and clear safety glasses. The worker on the left is wearing a 3M mask, and the worker on the right is wearing a Trident mask. The background shows medical equipment and a clean, professional environment. The image has a blue and purple color overlay.

The pandemic continued to have a significant impact on the ICU. In comparison to other parts of the world, we were fortunate in that we had time to prepare and learn from other health services.

RUSONs (Registered Undergraduate Students of Nursing) played a role in bolstering the workforce during the peak of the pandemic.

COVID-19 Pandemic Report

The pandemic continued to have a significant impact on the ICU. In comparison to other parts of the world, we were fortunate in that we had time to prepare and learn from other health services.

Key dates for Barwon Health ICU

From January 2020 - June 2020 there was extensive planning, preparation and training undertaken. A comprehensive equipment list was submitted to provide capacity for extra ICU beds, in alignment with the state health plan.

2020	
July	3 – ICU equipment to plan for expansion begins to arrive 14 – State-wide ICU coordinating meetings start with Adult Retrieval Victoria (ARV) 19 – First COVID patient admitted to our ICU
August	6 – First VV ECMO initiation for COVID patient
September	4 – Requirement for daily attestations by staff
November	11 – Qiagen POCT PCR available (in ED)
2021	
January	4 – N95-mask fit-testing commences at Barwon Health
February	22 – Vaccination rollout at Barwon Health (St Mary's Hall)
July	20 – First COVID patient of 2021 admitted to ICU 21 – Staff surveillance COVID testing commences
August	26 – ICU escalations plans reviewed and refined as cases escalating state-wide
September	7 – Barwon Health ICU activated as a streaming site 10 – First ARV transfer of COVID patient to BH ICU from an external ICU 16 – Pod 1 becomes a COVID Pod, Pod 3 opens. Medical staff redeployed to assist 27 – Working with ID team to have process for 'clearance' of COVID infection 28 – Communication with families with the use of iPads and videoconferencing. Extra nursing staff redeployed to assist with ICU capacity. 9 COVID patients in ICU
October	1 – Donation of food, which prompts the fruit box deliveries 11 – RUSONs commence in ICU, across all shifts. A total of 12 active COVID patients. 12 – ICU capacity at 21, with extra nursing and medical staff (including Anaesthetics and Theatre staff) 21 – Pod 4 opens and Pod 3 closes, allowing an extra 8 beds instead of 4
November	4 – 6 concurrent ECMO patients, 2-day internal nursing ECMO course to train more nursing staff in ECMO bedside care 16 – 7 concurrent ECMO patients
December	25 – No active COVID patients in ICU (since 9 Sept). Pod 1 returns to normal configuration. Throughout the month there still are patients with COVID requiring ventilation, and on VV ECMO.
2022	
January – June	There is a gradual transition back to 2 ICU pods. COVID cases requiring ICU admission decline, but rarely approach zero. There is an increase COVID transmission in the community resulting in staff sick leave which impacts on ICU capacity.

COVID-19 care

The ICU provided care for 81 patients with COVID over the previous two financial years.

The peak time for ICU admissions, in terms of both number of patients and high acuity, was during the Delta wave from September to December 2021. During this time, the northern and western metropolitan areas of Melbourne were impacted significantly, and our ICU received Adult Retrieval Victoria (ARV) transfers from external sites to assist with care of COVID patients in the state. Later in October 2021, there were more local cases. We were able to meet the local demand and our ICU transferred out only a small number of patients, for the sole purpose of requiring specialised care on VV ECMO.

Novel and emerging treatments such as remdesivir, tocilizumab, baricitinib, molnupiriver, nirmatrelvir/ritonavir (Paxlovid), and tixagevimab/cilgavimab (Evusheld) became available and were prescribed in conjunction with national guidelines and patient assessment.

ICU restructure

Much work was done in early 2020 to identify expansion areas of ICU if the need arose. There were several sites that had been identified as suitable for expansion ICU beds, including HW4, old HDU, Surgical Hub North and South, Building B and Perioperative Anaesthetic Care Unit (PACU) and Operating Theatre. Some of these sites required capital works, which was undertaken in conjunction with the state health department plan. A five-stage escalation plan was created, and at the full utilisation of these spaces we could have expanded our capacity to 124 ICU bedspaces, well above the current unit capacity of 24. We are eternally grateful we never needed to staff 124 ICU beds!

In August 2021, it was clear that we needed to review our escalation plans in readiness to enact as the numbers were increasing across the state. The first step of the escalation was to reconfigure Pod 1 into a COVID pod. All staff entering the Pod had to be in appropriate PPE and patient care was modified to reduce risk. Only patients with active COVID, or who had been recently cleared from COVID were cared for in Pod 1. The restructure meant we needed to have an additional Pod open to care for more ICU patients. Initially this was in Pod 3 (old HDU), where 3-4 patients were managed. When it became clear that more space was required, the Surgical Hub North was transformed into Pod 4.

Up to eight patients were cared for in Pod 4 at any one time. These were often post-operative patients, including following cardiac surgery, or patients post-COVID on a long ventilatory wean. Patients on ECMO were cared for either in Pod 1 or Pod 2. It was an impressive sight to see these clinical spaces transformed overnight into surge ICU capacity. Many hands were involved in setting up the bedspaces and clinical areas with the appropriate equipment.

Education

- › COVID-related education included advanced ventilation management, facilitating prone positions (including for patients on ECMO), COVID intubation and extubations (including a 'dry run') prior to the event, and upskilling staff in the many new equipment devices that arrived.
- › Much of the education was delivered to both medical and nursing staff concurrently and this facilitated a real sense of the team dynamic required during this period.
- › Redevelopment of MET and CODE BLUE procedure in line with personal protective equipment requirements, aerosol risk, and equipment modifications.

Equipment

- › Arrival of lots of new equipment – 50 ventilators, 3 cardiohelp ECMO, 6 prismaflex dialysis plus numerous beds, IV pumps.
- › Upgrade of the wifi in ICU that better facilitated the isolation rooms and patient and staff video conferencing.

Recruitment - Nursing

- › Co-ordinated approach to asking current staff to nominate extra hours if possible
- › Redeployment of ICU staff in non-clinical roles to some clinical hours
- › Redeployment of ex-ICU staff working outside the ICU back to the ICU for clinical hours
- › Identified staff on leave who may be able to return earlier, or in a casual capacity
- › Redeployment of theatre staff to assist in staffing
- › Employment of RUSONs to ICU, particularly at night
- › Minimise non-essential leave during the peak period in ICU
- › Formulated plans for team-based nursing, should the need arise.

Recruitment - Medical

- › Many junior medical staff were redeployed early which assisted in staffing of Pod 3 and Pod 4.
- › Current ICU specialists deferred leave, were recalled from leave, and decreased clinical support time to increase clinical hours on the roster. This allowed for additional on call, outreach, and weekend clinical hours.
- › During the peak period of activity, several anaesthetists were voluntarily redeployed to ICU and provided much appreciated assistance with procedures, transport of patients, airway management during proning and de-proning of patients, and general ICU care under the supervision of the ICU specialist.
- › Anaesthetists also assisted in provided resources for the central line service with a core group allocated and performing this service in conjunction with the ICU specialists.

Research / safety & quality

- › Some research and S&Q hours were converted to clinical hours during the height of ICU COVID activity. During this time, we were still recruiting into COVID relevant trials and data sets and collecting important data for our ICU patients. Selected work was put on hold.

Allied Health

- › Allied health staff, including pharmacists, dietetics, social work, speech therapists and physiotherapists collectively worked with us to identify their escalation needs and plans. We relied on the experience of our staff to assist in setting up of new clinical spaces, communicating with families and innovating on the run.
- › Remote access to ICU databases arranged to support work from home or other options including e-referrals to facilitate less face-to-face contact with the ICU.

Administration staff

- › Extra hours were allocated in the peak period, which assisted with medical rostering, general tasks, and family communication planning.

Visitors

- › There were variable restricted visitor periods during the last two years, in line with public health orders for hospitals.
- › Our staff were able to provide regular phone updates to families and offer the ability to videoconference so families could see their loved ones.
- › End-of-life care was supported as best possible with family able to visit under these circumstances, with nursing staff assisting families with the PPE requirements.
- › ICU reception staff were able to schedule family visiting times to minimise risk, and in line with current DHHS guidelines.

Staff welfare

Our staff were under considerable stress during this time – with the combinations of external stress, need for PPE, care for increasing numbers of critically ill patients, and high risk of moral distress and moral injury. It has been clear that there is an awareness of the COVID pandemic impact on healthcare workers worldwide, and we realise we are not immune.

Staff were supported by leaders, with both emotional support and other initiatives such as night-time meals, regular fruit boxes, tea and coffee, external gifts. We also had group sessions available from the EAP provider.

We look forward to being able to have more regular social gatherings which do play such an important part in connecting with and supporting one another. Unfortunately, multiple social gatherings during this time were postponed or cancelled due to public health orders.

The staff wellness work will be ongoing as we all try to get a sense of moving forward, trying to live with COVID, and recover from the multiple impacts of a significant pandemic.

Regional support

Senior nursing and medical staff remained in close communication with healthcare services in our region. We were able to offer support and share our resources as needed. As the pandemic evolved, patients were able to be cared for in their regional centres.

Culture and leadership

The ICU is committed to building leadership and improving culture and engagement. This is more important now in the years following the pandemic when there is a high level of staff burnout, moral distress and moral injury.

Significant work commenced in 2018/2019 with Be the Heart of Barwon Health culture and leadership program. This was a pilot program and was able to help us gain insight into what mattered to ICU staff.

The following year we had a combined nursing and medical leadership and culture program with The Nous Group. We identified two leadership behaviours that would be helpful during the pandemic:

- › ***Be kind, patient and compassionate***
- › ***Take care of your own and others wellbeing***

We built on this leadership work in 2020-22.

The ICU consultants undertook a 360 assessment and individual feedback with the Nous group. This was a first for many of us and a fantastic opportunity for personal growth and development.

The Nursing and Medical Leadership Group were able to undertake further combined sessions, and we were able to tailor the sessions to the need of the group. It was no surprise due to the pandemic the topics of wellbeing and resilience were areas we wanted to develop.

We were guided in our sessions through the domains of purpose, mind, energy, and environment. Our focus was on:

- › Our purpose as leaders and aligning our values.
- › Increasing self-awareness of mind talk, taking advantage of positive talk, and reducing the impact of negative self-talk.

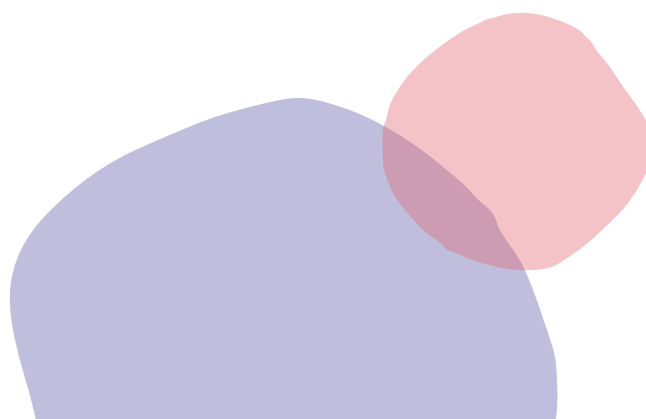
- › Building our skills for helping our staff to manage demands. This work included the importance of simple and clear communication and building psychological safety and trust in our department. We discussed how we could help other with their mental wellbeing.
- › Awareness of the need for our energy through mental and physical aspects, including fun and humour as antidotes to stress. Building energy to prepare yourself for the performance zone.
- › Building supportive networks, utilising our environment for wellbeing and resilience.

The timing of the group leadership sessions was fortunate as we finished the program just as we started seeing a higher number of COVID patients.

The post-program evaluation was positive, in that the respondents felt they had increased the ability to understand the impact of their leadership, there was motivation to continue and develop as a leader, participants were confident they could assist in helping others' wellbeing. There was enthusiasm to continue the leadership work.

What people enjoyed about the program:

- › ***"Facilitated group sessions with medical and nursing that were tailored to the group"***
- › ***"Providing an opportunity for real cultural change in our unit"***



Multidisciplinary Care

Social work

Social work is an active part of the multi-disciplinary team with the primary focus on supporting both patients and families during critical illness. Social workers have clinical skills to provide support to patients and families facing increased stress due to social, legal, financial, practical, and emotional issues related to the unexpected nature of an admission to ICU.

This may include issues such as situational crisis, chronic and acute illness, injury, and disability. Social work interventions can be provided effectively to assist in reducing family distress and avoiding care that is unwanted by patients whilst clarifying medical goals for patients can often be facilitated by assessing pre-existing psychosocial factors. In addition to patient and family support, social work also provides support to staff as required during and post critical events.

More specifically, the ICU social worker provides the following services.

- › Information and support around legal issues including power of attorney, guardianship, medical decision making, VCAT/OPA; financial matters including Centrelink, TAC, WC, superannuation; practical issues and bereavement support including the processes to after the death of a patient.
- › Assist with identifying patients who are admitted with no identification and contacting family members when there are no next of kin details available.
- › Counselling including addressing the immediate crisis, long standing family issues, grief, trauma and bereavement and where required referral onto external counselling services.
- › Comprehensive psychosocial assessments are completed to identify issues impacting on the patient's hospital admission, recovery, and discharge planning.
- › Comprehensive mental health assessments are completed on patients admitted post suicide attempt to establish premorbid functioning, previous involvement with mental health, triggers leading to admission and key concerns from family members and the patient (if capacitated) to aid consumer liaison psychiatry services in their assessment.
- › Social work assesses and address many of the complex psychosocial circumstances that arise during an ICU admission and clarify potential misperceptions, enhancing communication among patients (if capacitated), their families, and the medical team members, thus reducing the likelihood of decision-making conflicts.
- › For patients being discharged directly from ICU, social work completes a full psychosocial assessment to facilitate support on discharge if required.
- › Social work provides information on accommodation options available to family members of patients admitted from outside of our region, including information on financial assistance available (if eligible) including Victorian Patient Transport Assistance Scheme (VPTAS). Accommodation can also be arranged in two rooms at Kitchener House if a family member is financially unable to fund accommodation. Social work can complete the approved medical specialist section of the VPTAS form, thus reducing requests for medical staff to complete paperwork.
- › Assessment for 'at-risk' patients is carried out as required. Patients who fall into this category include those with no known next of kin, facing domestic/family violence, child protection issues, elder abuse, financial abuse, alcohol and substance abuse, mental health issues, legal/criminal issues, and cognitive issues.
- › Palliative care in ICU is very important – it often occurs suddenly and unexpectedly for patients and families and additional support is provide during these difficult times. The ICU social worker joined with the Barwon Health Foundation to improve the experience of end-of-life care through the provision of keyrings where a heart pops out of the middle and can be sent with the patient and the family keep the other part of the keyring. We hope that this will assist in the grieving process and make the experience a little more bearable. Feedback from families has been very positive.



- › The ICU social worker attends the daily ward multidisciplinary meeting and additionally provides support to all staff in ICU when there are complex cases in the unit as well regarding personal matters for staff. The ICU social worker is working with Dr Nick Simpson with regards to developing a well-being support program for all ICU staff.
- › In 2022, COVID continued to impact the direct role for social work. Family members had limited access to visiting patients in ICU and support was provided via telehealth methods. The role of social work has been significantly important as a link between busy medical and nursing staff and very concerned relatives. It was difficult for family members to understand the physical environment their relative was in and subsequently they had difficulty understanding the significance of their relative's illness.
- › The ICU social worker is progressing a family-based research project that will investigate family satisfaction in ICU with regards to the care of their family member. The data from this project is expected to reflect the complications of COVID-19 restrictions. It is hoped that in the future the same research project can be implemented when families are not impacted by COVID-19 restrictions. This project is being completed in partnership with Dr Nick Simpson.
- › The ICU social worker participated in a working party with ANZICS looking at developing PROEMS tools that can be utilised in ICUs across Australia. The ICU social worker presented on the role of social work during Covid-19 at the invitation of the Critical Clinical Care Network (CCCN).
- › The ICU social worker participated in a review of social work services with ANZICS to develop a minimum standards document.
- › Stats for 2021-2022 (includes patient and families, may include multiple interactions)
 - Total patients assessed by social work = 400
 - Total occasions of service provided by social work = 1221

Physiotherapy

The past two years of the COVID pandemic has narrowed the focus of the physiotherapy team down to core business; the provision of quality patient care, supporting medical and nursing staff as well as teaching and training physiotherapists new to the Intensive Care environment.

During the peak of the COVID pandemic, there was a significant redeployment of physiotherapy staff as Outpatient and Community Health services were closed. Staff from these areas were directed to acute care at University Hospital Geelong. As many of these staff had not had recent practice in acute care, an orientation program was deployed to provide a supported and safe learning opportunity for them. The addition of these staff allowed the ICU physiotherapy team to contribute to the overall ICU service by picking up additional patient care activities, such as routine patient mobilisation and assisting with routine positioning changes. The provision of extra bodies assisted in reducing some of the heavy workload experienced by the ICU team. As clinical experts in mobilising complex patients, we could share our experience with new members to the ICU team whose background may have been in theatre, anaesthetics as well as the medical and surgical wards.

The opportunity to work in Intensive Care has broadened the scope of many physiotherapists who otherwise may not have had this experience. Some have taken this as a chance to continue with acute care and investigate further studies, whilst others have gladly returned to community care with renewed enthusiasm for an area they are more interested in. With this has come the challenge of maintaining a skilled ICU physiotherapy service, as staff have moved on after an intense and at times draining two years. This experience has highlighted that the provision of enough staff to get the job done makes even the greatest challenges manageable. We are very appreciative of all staff who have contributed to the ICU service over the past two years.

The future challenges for the Physiotherapy service will be in returning to a more holistic approach that enables a balanced and sustainable career for those with an interest in the ICU space. The ongoing work in the unit is looking at team culture, inclusivity and respect are all good signs of moving in a direction that makes this more achievable.

Dietitians

As with all areas, the past two years have certainly presented some unique and interesting challenges for the ICU dietetics team. These have ranged from mapping out increased surge staffing, adapting to remote and restricted working practices, dealing with unprecedented enteral feed supply issues, and fast-tracking new pathways, such as feeding whilst a patient is in the prone position.

More recently, we have welcomed some new dietetic team members on to the unit – Michelle Corray and Kim Dutton.

Other work has included undertaking in-services for the ICU Discovery Nurse program, finalised the adult after hours feeding protocol and gastric residual management pathways, and become involved in the exciting nutrition trial – TARGET PROTEIN. We look forward to continuing to improve our dietetic service to the unit, including review of paediatric working practices.

Pharmacy

Pharmacists play a key role managing medicines in ICU patients with the complexity of administration routes, severe and rapidly shifting pharmacokinetic and dynamic parameters. The Pharmacy department provides comprehensive medication management and supply to Barwon Health ICU patients and supports the members of the ICU healthcare team in all aspects of pharmaceutical care and medication safety.

ICU clinical pharmacists attend the daily ward rounds, multidisciplinary team meetings and represent pharmacy at other relevant ICU meetings and provide education. The ICU pharmacists also provide support to the ICU research nurses, report a monthly medication usage, and continue an ongoing review of Prompt protocols and medication related Riskman reports.

Pharmacy pandemic response

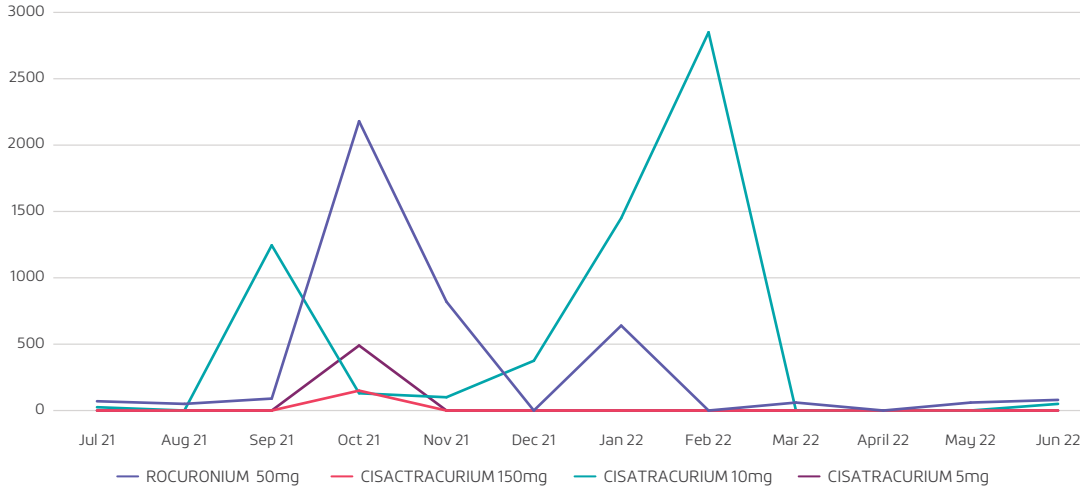
COVID-19 pandemic planning and response for pharmacy services to the ICU focused on stock management and supply alongside increased clinical workload. This included the implementation of partnered pharmacist medication charting for ICU ward rounds, parenteral nutrition, and ward transfer medication orders to facilitate multidisciplinary teamwork.

The expansion of the ICU service at UHG to a 3-4 pod unit was supported by the ICU pharmacists and ICU pharmacy technician. This support included expanding inpatient in two new locations and the introduction of a weekend clinical pharmacist service to support the surge capacity of the unit.

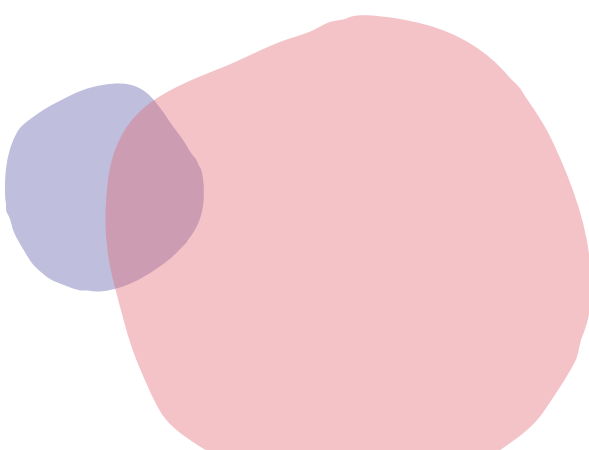
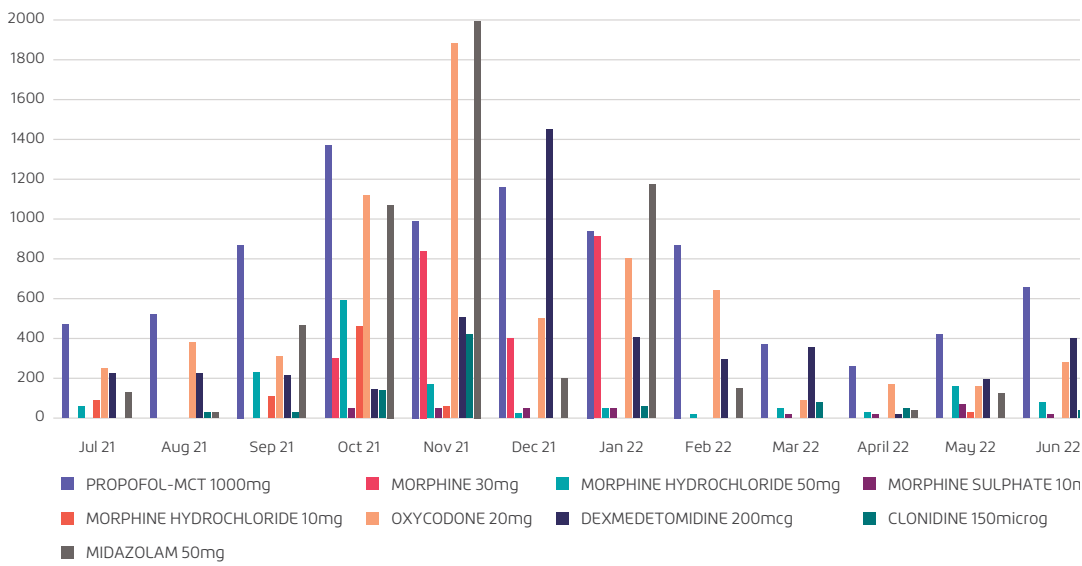
The surge capacity weekend ICU clinical pharmacist service was provided for 26 morning shifts between October 2021 and February 2022. During this time, the pharmacist provided clinical intervention +/- completion of admission medication management plan and reconciliation for 170 patients, alongside medication and fluid stock supply and management.

Pharmacists also provided guidance for medication substitution in preparation for expected and actual medication stock shortages and facilitation of medication supply, via the National and Victorian medication stockpile for surge capacity and Covid-19 specific therapies. The following graphs demonstrate visually increased stock requirements and unavailability's managed by the pharmacy department for ICU.

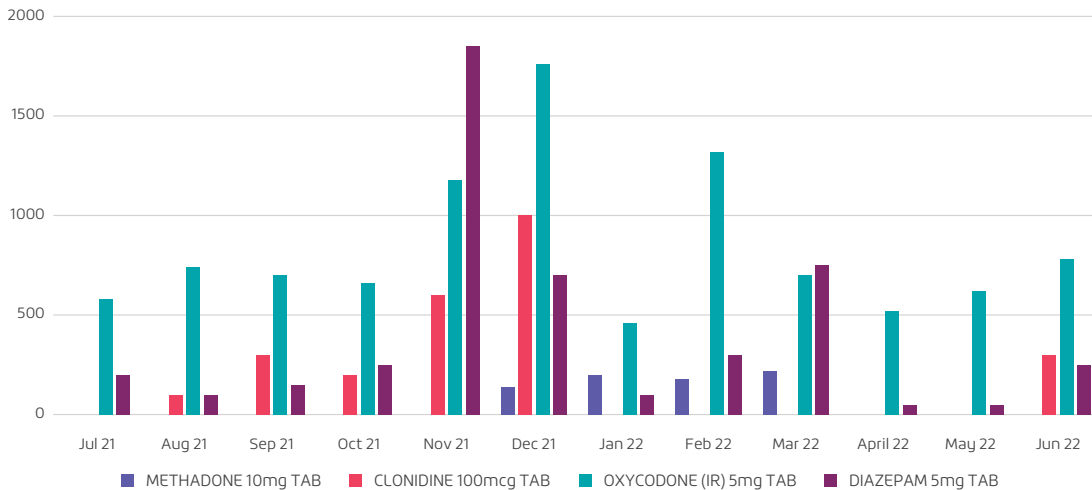
Muscle Relaxants 2021/2022



Parenteral Sedation 2021/2022



Enteral Sedation 2021/2022



External Critical Care Committee Representation (Rachel Fyfe)

Chair (2022) and Member (2020-22) of the Critical Care Leadership group for the Society of Hospital Pharmacists of Australia (SHPA).

Collaborate with the multidisciplinary team to drive improvement of healthcare delivery as a member of the Critical Care Clinical Network Coordinating Committee for Safer Care Victoria (SCV).

Other initiatives

- › Involvement in the multidisciplinary working party for the Clinical Care standard for VTE prophylaxis for Barwon Health
- › Participated in the yearly National Antimicrobial Prescribing Survey (NAPS)
- › Participation in the ClinCAT program for clinical pharmacist competency and professional development
- › **SHPA Advanced Training Residency Critical Care Framework and Knowledge Guide:** Development, review, and endorsement as part of the SHPA Critical Care Leadership Committee
- › **SHPA Foundation seminar in critical care 2020 and SHPA Extension seminar in critical care 2021:** Presenter and tutor
- › **Guest lecturer for Critical Care:** RMIT Bachelor of Pharmacy
- › **SCV webinar presenter:** ICU allied health care for COVID patients in 2021

Publications

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- Marshall AP, Austin DE, Chamberlain D, Chapple LS, Cree M, Fetterplace K, Moster M, Freeman-Sanderson A, Fyfe R, Grealy BA, Hodak A, Holley A, Kruger P, Kucharski G, Pollock W, Ridley E, Stewart P, Thomas P, Torresi K, Williams L. A critical care pandemic staffing framework in Australia. *Aust Crit Care* 2020. Published online DOI: 10.1016/j.aucc.2020.08.0071036-7314

ECMO

Barwon Health remains the second busiest ECMO provider in Victoria and is one of only two Tier 2 ECMO providers in The Victorian ECMO Service (VECMOS). We are recognised for delivering high-quality ECMO support to not only the greater Geelong community but also to many patients from south-west Victoria.

While the COVID-19 pandemic's impact meant a reduction in ECMO caseload in the 2020/21 financial year, this allowed us to focus on unit preparedness, with emphasis on increasing education and training curricula delivery and development. The unit was thus prepared for the influx of COVID-19 ECMO patients in the 2021/22 financial year, which saw a total of 474 ECMO days, nearly three times higher than 168 ECMO days of the previous busiest ECMO year in 2017. 2021 also saw the first ECMO patients retrieved to BH via VECMOS from outside the Barwon South West region as part of the COVID-19 ECMO load sharing response.

UHG ICU ECMO Activity COVID Patients 2020-2022

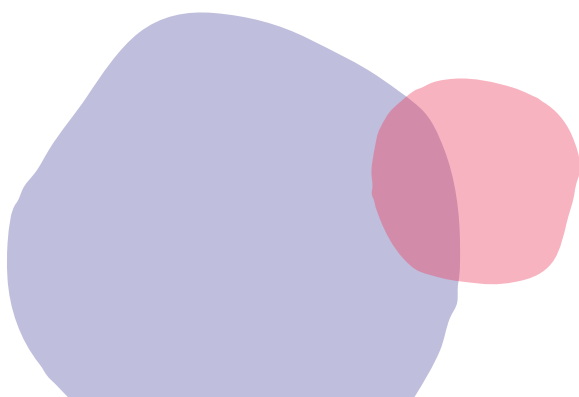
Activity	Number of ECMO runs 21-22
COVID VV Caseload	13
Total ECMO days	416
Interhospital transfer	2 Transfers to the Alfred hospital 4 transfers in via VECMOS
Survival to: ECMO wean	11/13 (85%)
ICU discharge	11/13 (85%)
Hospital discharge	11/13 (85%)

2020-2021

In 2021 we saw the introduction of a full-time ECMO coordinator role to assist with the ongoing coordination and development of our service. A total of 12 ECMO patients were treated bringing our total patient numbers to 152.

UHG ICU ECMO Activity FY: 20/21

Activity	Number of ECMO runs 21-22
Caseload	12
VV	2
VA	9
ECPR	1
Total ECMO days	91
Interhospital transfer	2 Transfers to the Alfred hospital
Survival to: ECMO wean	8/12 (66%)
ICU discharge	8/12 (66%)
Hospital discharge	7/12 (58%)



2021-2022

During the latter half of 2021, Victoria went through the third wave, which saw the highest number of COVID patients admitted to hospital. Subsequently, ICU admissions were at its highest, with critically ill patients requiring advanced respiratory support provided by ECMO.

As a Tier 2 VECMOS site, UHG ICU was able to care for both local patients and those retrieved from Melbourne and other regions. In the 2021/22 financial year, we treated 23 ECMO patients, bringing our total to 175. The case mix saw a change from an average of 33% VV ECMO patients to 60%, due to the COVID-19 patient cohort. These VV ECMO patients required prolonged duration of support, with majority being on for >28 days, with the longest ECMO duration of 80 days, thus taking up a considerable number of resources. Due to the preparations in the previous year, we were able to provide a safe service. During this time we provided ECMO support to seven patients concurrently which was a significant increase from our previous concurrent number of three patients at once. During the peak of the COVID-19 admissions, we trained a cohort of 12 new ECMO Nurse Specialists to support the increase in ECMO caseload. Our local perfusion staff provided significant support to our service provision during this period of increased activity.

UHG ICU ECMO Activity FY: 21/22

Activity	Number of ECMO runs 21-22
Caseload	24
VV	14
VA	6
ECPR	4
Total ECMO days	474
Interhospital transfer	2 Transfers to the Alfred hospital 4 transfers in via VECMOS
Survival to:	
ECMO wean	16/24 (66%)
ICU discharge	14/24 (58%)
Hospital discharge	14/24 (58%)

Safety and Quality / Research

We continue to provide our data to the Extracorporeal Life Support Organisation (international) and EXCEL (ANZ) ECMO registries. We also contribute to a national research trial (BLENDER) under the auspices of ANZICS Research Centre. Both these contributions will help to inform practice both within Victoria and internationally in the future.



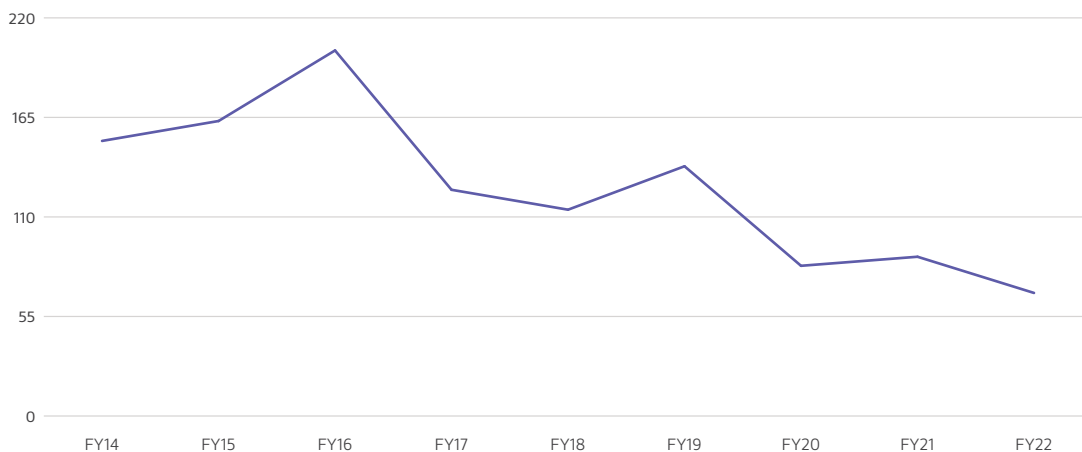
ECMO Coordinator Meg Gallagher

Paediatrics

The COVID-19 pandemic was associated with a significant change in the demands on our Paediatric ICU service. Since a peak in admissions of 202 in FY2016, numbers have fallen to a low of 68 for FY2022 Admission Data.

The two financial years reported here were at a time of peak COVID-19 demand on Victorian ICUs, with University Hospital Geelong being no different and contributing significantly to load balancing for several large Melbourne metropolitan hospitals. The effects of public health measures, first implemented in FY20 to control the spread of COVID-19, had a predictable effect reducing the seasonal viral illnesses responsible for a large proportion of our Paediatric ICU admissions.

Paediatric Admissions by Financial Year Ending



FY20-21

There were 88 admissions, which represented 41% of Victoria's PICU admissions excluding the dedicated units at RCH and MCH. 14 (16%) were under 1-year old, 32 (36%) aged 1-5 years, 14 (16%) aged 6-10 years and 28 (32%) aged 11-15 years. There were no deaths. 4 (5%) of these children were of Aboriginal or Torres Strait Islander descent. Compared to the preceding year, this represented an older cohort with less than half the prior years' number of under 1-year-olds. All admissions were emergency (non-elective) in keeping with previous years. Thirteen patients were intubated and mechanically ventilated for a mean ventilation time of 32 hours (range 1.5-152 hours). Four (5%) children received inotropic support, three for anaphylaxis and 1 for septic shock. Eighteen (20%) were transferred to us from another hospital without Paediatric ICU capability which is consistent with previous years.

FY21-22

There were 68 admissions accounting for 44% of the state's PICU admissions excluding the dedicated units at RCH and MCH. Fifteen (22%) were under one, 23 (34%) aged 1-5, 14 (21%) aged 6-10 and 16 (24%) aged 11-15. Compared to FY20-21, this represented a more even distribution of ages. Again, there were no deaths, and all admissions were emergent in nature. 1 (%) child was of Aboriginal or Torres Strait Islander descent. 7 patients were intubated and mechanically ventilated for a mean ventilation time of 31 hours (range 2.5-85 hours). 1 child received inotropic support for anaphylaxis. Nine (13%) children were transferred to University Hospital Geelong from another source without Paediatric ICU capability.

Education

Despite COVID-19 impacting significantly on our ability to facilitate external face-to-face courses, two Paediatric BASIC courses were provided in the first half of 2021. These were well attended by a multidisciplinary group of medical, nursing, and allied health staff. We also provided regular consultant facilitation at the Paediatric Life Support courses in addition to registrar attendance.

Governance and protocols

During the financial years 2020-2022, three comprehensive guidelines were developed, largely thanks to paediatric medical lead, Dr Scott Simpson. These included ICU sedation guidelines for both intubated and non-intubated children and a dedicated paediatric Diabetic Ketoacidosis (DKA) guideline. All three have provided valuable references for care of these patients in the unit. The DKA protocol being implemented by the Emergency Department at times as well, with positive feedback as to its ease of use and utility.

Future

The start of FY22-23 has seen an increase in paediatric activity again both for Barwon Health and our Paediatric ICU service. We continue to support our paediatric aligned services within the organisation, including formally providing support for high-risk elective orthopaedic surgery for children with complex chronic disease. At a state level, we continue to contribute meaningfully to caring for children from Western Victoria, with between 10-20% of our cases coming from another hospital.



Research

Research is an integral component of the Intensive Care Unit at Barwon Health. It ensures we understand how to best treat patients and adapt to changes in health science.

Patients enrolled in clinical trials are known to have better health outcomes. Furthermore, conducting clinical trials provides new knowledge to enable provisions of evidence-based healthcare for future patients. For these reasons, our goal at Barwon Health is to **'afford every patient in ICU the opportunity to participate in a clinical trial'**. Subsequently, we have seen a dramatic increase in the number of patient enrolments in clinical trials. This has been a team effort from all who support clinical research.


A research highlight was commencing the BONE-ZONE clinical trial, an MRFF funded (\$1.9 million) 'home grown' project. This is the culmination of many years work led by A/Prof Neil Orford examining bone loss after critical illness.

Despite the many challenges encountered with COVID, collaboration throughout our department and the organisation ensured ICU research activity was maintained. This was led by ICU research staff, working closely alongside nursing and medical staff, ancillary and administrative staff, pharmacy, physiotherapy, dieticians, research support office, clinical trial research centres ... and most importantly, patients and their family / friends.

Projects that remained 'active' and had ceased enrolling patients

- › Nebulised heparin for lung injury (NEB-HEP)
- › Trial of early activity and mobilisation in ICU (TEAM)
- › A phase II study of Liberal Glucose Control in Critically Ill Patients with pre-existing type 2 diabetes (LUCID)
- › Prophylactic melatonin for the prevention of delirium in intensive care (ProMEDIC)
- › A phase III randomised controlled trial of continuous beta-lactam infusion compared with intermittent beta-lactam dosing in critically ill patients (BLING-III)
- › Australasian registry of the use of parenteral nutrition in hospitalised patients (ARTPN)
- › Targeted therapeutic mild hypercapnia after resuscitated cardiac arrest: A phase III multi-centre randomised controlled trial (TAME)
- › Intensive nutrition therapy compared to usual care in critically ill adults: A randomised pilot trial (INTENT)
- › Prevalence and management of metabolic acidosis with sodium bicarbonate in the ICU
- › Patterns of artificial kidney failure in continuous renal replacement therapy: a multicentre assessment

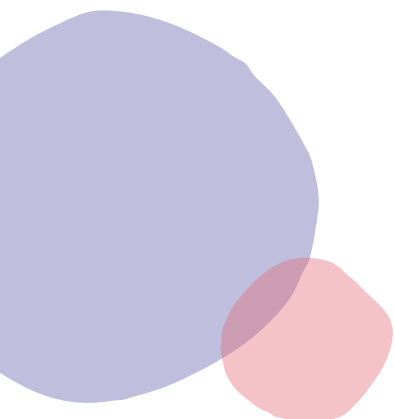


A man in a white lab coat and glasses is pointing at a computer monitor in a laboratory setting. The monitor displays a complex interface with various data points and charts. In the background, other people in lab coats are visible, suggesting a busy research environment. The overall scene is bathed in a soft, blue light, creating a professional and scientific atmosphere.

Research is an integral component of the Intensive Care Unit at Barwon Health. It ensures we understand how to best treat patients and adapt to changes in health science.

Clinical trials conducted at Barwon Health ICU and the number of enrolments

Trial Title	Trial Name	Enrolments 2020-2021	Enrolments 2021-2022
Randomised, embedded, multifactorial adaptive platform trial of patients admitted to intensive care units with severe community-acquired pneumonia.	REMAP-CAP	5	33
A collaborative bi-national registry on the treatment and outcomes of patients requiring ECMO	EXCEL	6	23
Blend to limit oxygen in ECMO: A randomised controlled registry study	BLENDER	2	1
Bone loss prevention with Zoledronic Acid or Denosumab in critically ill women – A randomised controlled trial	BONE-ZONE		8
The re-evaluating the inhibition of stress erosions trial	REVISE		1
Treatment of invasively ventilated adults with early activation and mobilisation	TEAM	4	
Targeted therapeutic mild hypercapnia after resuscitated cardiac arrest: A phase III multi-centre randomised controlled trial	TAME	3	
A phase III randomised controlled trial of continuous beta-lactam infusion compared with intermittent beta-lactam dosing in critically ill patients	BLING-III	1	
ANZICS point prevalence study	PPP	17	15
The mega randomised registry trial comparing conservative vs liberal oxygenation targets	MEGA-ROX		7
Short period incidence study of severe acute respiratory infection	SPRINT-SARI		104
Intensive care admission and haematological malignancy: An interpretive phenomenological study of the lived experience of patients, family, and clinicians.	HaemOnc		8
20% human albumin solution fluid bolus administration therapy in patients after cardiac surgery-II	HAS-FLAIR II	9	63
Effect of denosumab on bone turnover markers in critically ill women – A safety and feasibility, randomised, placebo-controlled trial	SOFTER	2	
International point prevalence study of intensive care unit transfusion practices	INPUT		19
COVID-19 critical care consortium	COVID Critical	2	48
TOTAL		49	330



Publications – Projects led by Barwon Health ICU staff

Elderkin T, Bone A, Orford NR, Maiden MJ, George Institute for Global Health; Australian and New Zealand Intensive Care Society Clinical Trials Group. **Patients with pre-existing life-limiting illness in the intensive care unit: a point prevalence study.** *Crit Care Resusc* 2020 Sep;22(3):285-286.

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Low Y, Lyon C, Lakey K, Finnis ME, Orford NR, Maiden MJ. **Frailty is not independently associated with Intensive Care Unit length of stay: An observational study.** *Aust Crit Care* 2022 Jul;35(4):369-374

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Wong HZ, Brusseeleers M, Hall KA, Maiden MJ, Chapple LAS, Chapman MJ, Hodgson CL, Gluck S. **Mixed-mode versus paper surveys for patient-reported outcomes after critical illness: A randomised controlled trial.** *Aust Crit Care* 2022 May;35(3):286-293

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Research staff

Allison Bone
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Stephanie Pearce
Michelle Horton
Jemma Trickey
Matthew Maiden

Person Centred Care

The iValidate program continues to promote values-based, person-centred shared decision-making within and outside ICU, with a current focus on the high-risk surgical patient group. Training clinicians in how to have effective conversations about values and goals has been important in providing care that is individualised.

An aligned program of research has continued to demonstrate benefits, including recent publications demonstrating improved documentation of values and a better reflection of personalised goals. In addition, iValidate training is the strongest predictor of a patient being engaged in shared decision making in ICU.

Members of the ICU team continue to be involved in iValidate teaching, training, and ward support. This includes interdisciplinary training with collaborating departments including General Medicine, Surgery, and Emergency Medicine, and external CICM endorsed course for fellows and trainees. Over 1000 doctors, nurses, and allied health professionals have been trained from Aboriginal communities in the Top End to the coast of New Zealand.

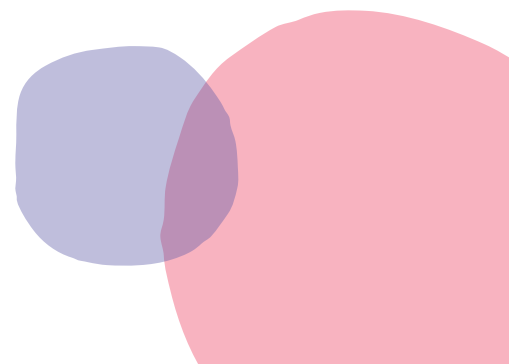
Label	Odds Ratio multivariate	P-value
Diagnosis		0.03
COPD vs cancer	6.25 (1.58-24.79)	
Surgery vs cancer	1.28 (0.37-4.5)	
Other vs cancer	1.69 (0.6-4.78)	
Pneumonia vs cancer	5.2 (1.22-22.28)	
Infection vs cancer	3.38 (0.77-14.87)	
Age	1.03 (1-1.06)	0.03
iValidate trained doctor	22.77 (11.91-43.54)	<0.0001

A long-term patient meeting continues, with a multidisciplinary discussion on Tuesday mornings, aimed at supporting the complex care needs of ICU patients with prolonged stay. These meetings have allowed a discussion around multiple issues such as pressure care, nutrition, and mobility. They allow a forum for the multidisciplinary team to come together including input from social work, pharmacy, physiotherapy, dieticians, speech pathology, nursing, and medicine.

The care of the dying protocols and processes are being transitioned to the ICU online health record (SLIC), to enhance the potential to focus on the quality of care at the end of life. This focus on end-of-life care is aimed to improve personalised support at this time. ICU staff continue to use a range of methods to communicate with relatives, with an emphasis on frequent updates and clear information. This approach has been helpful in easing some of the burdens of a lack of physical access.

iValidate: a communication-based clinical intervention in life-limiting illness

Year	BH	External	Totals
2015	36	0	36
2016	87	0	87
2017	125	23	148
2018	115	26	141
2019	173	164	337
2020	92	31	123
2021	99	123	222
Total	727	367	1094



Outreach Service and Rapid Response

The ICU Outreach service has continued to deliver timely review and follow up for patients needing critical care advice, assessment, and management.

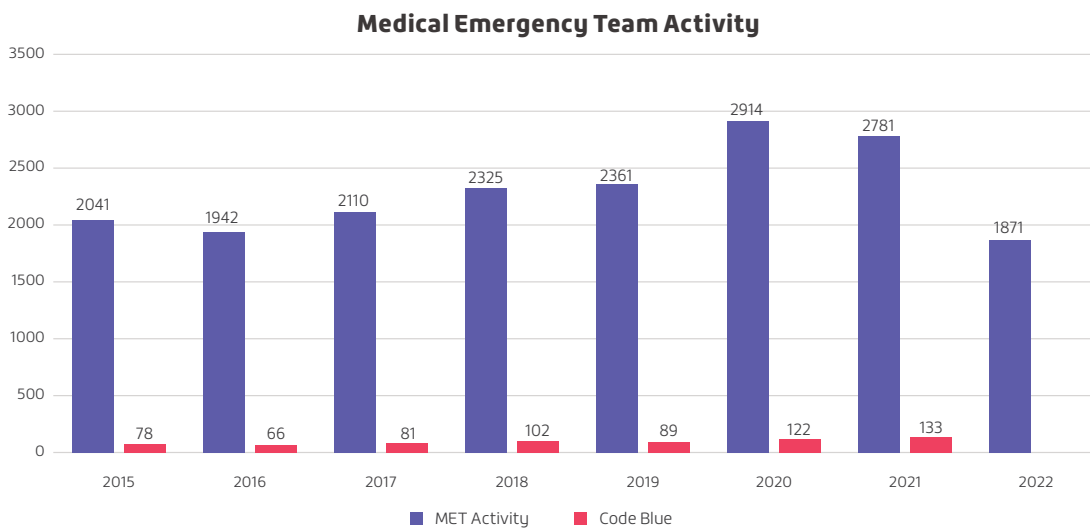
The service comprises of a senior critical care nurse and ICU registrar 24 hours a day, and during business hours an ICU Consultant in the hospital, and on call after hours. The Outreach service roles and responsibilities include:

- › Leadership and critical care skills at Rapid Response calls (MET and Code Blue)
- › Follow-up and review of patients discharged from the ICU
- › Assess referrals for ICU admission from the Emergency Department, in-patient units, and the Adult Retrieval Service
- › Involvement in shared decision-making discussions with patients requiring complex surgical intervention
- › Oversight of the UHG TPN service which includes reviewing patients referred for TPN, daily review of patient and investigations and TPN prescription.
- › Facilitates transitional care of long-stay ICU patients to the wards
- › Provide education and support to ward nursing staff.

Rapid Response – Medical Emergency Team

The ICU Outreach service along with the General Medical MET registrar, the home team medical representatives and bedside nurse make up the Medical Emergency Team, available to attend medical emergency calls and with the addition of Anaesthetic support attends Code Blue calls. This brings critical care services to the bedside for rapid assessment and management of deteriorating patients. 2020 saw the introduction of the Silent Hospital project, with removal of MET calls from the overhead announced system. This project required changes to workflow practices across many areas with a new reliance on the Raulands system to alert individual ward staff of MET calls. The Outreach team was integral in its planning and implementation, ensuring patient benefits have been achieved and continues to work through issues with ward and home team alerts.

Rapid Response Activity: Calendar Year 2015 – 2022 (July)



2022 data Jan-July

The Code Blue activity includes neonatal, paediatric, and adult calls. The Code Blue data does not reflect cardiac arrest events that require advanced life support response. Data suggest there is on average 3.5 cardiac arrest events per month (1-7) that require ACLS. This data does not include cardiac arrest event in ED or ICU as these are not recorded in the current data set.

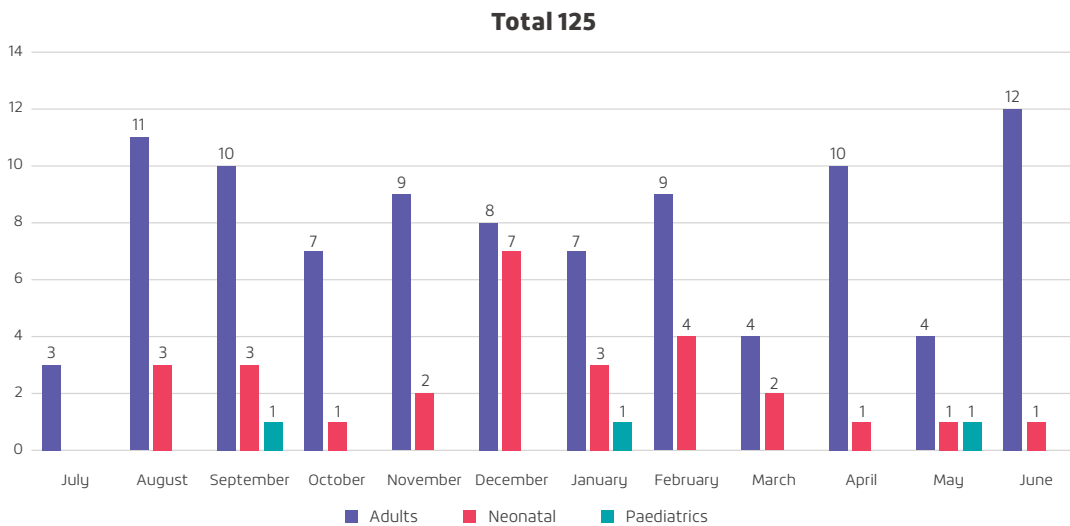
Financial Year 2020 – 2021

There were 2943 rapid response calls for the financial year 2020 to 2021, compared to 2527 for the previous year.

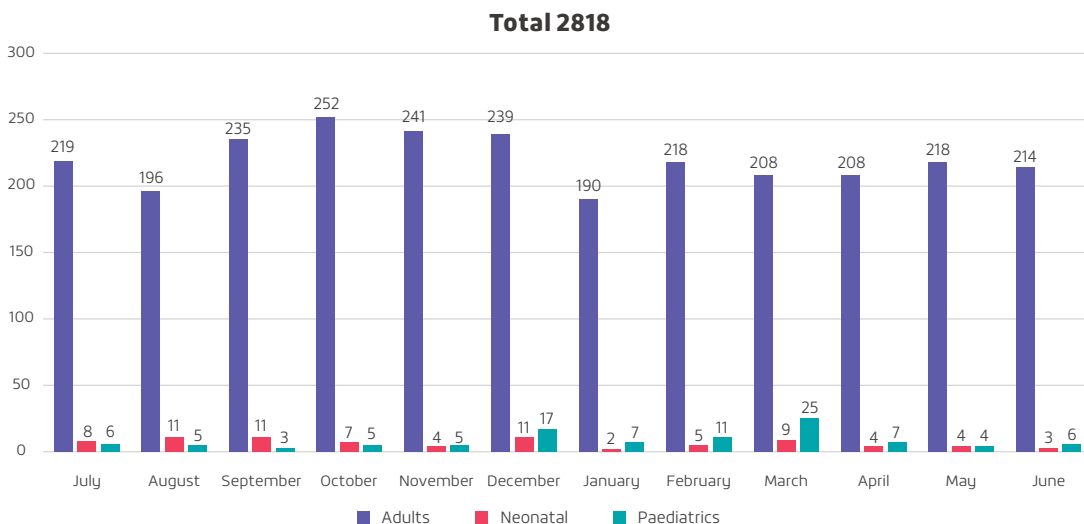
This provides significant challenges to the outreach team in terms of staff availability, particularly out of hours when dedicated outreach staff are not always available to attend to deteriorating patients who trigger an emergency call.

The outreach team has spent significant time preparing and presenting a business case to increase the resources available to ensure safe and timely response to deteriorating patients at all times, without causing depletion of resources for patient care within the ICU. This effort was successful, with the increase in nursing FTE allowing for a 12hour/day ICU Liaison nurse service, a dedicated ICU MET nurse overnight, and an ICU Consultant rostered three days a week as available.

FY 2020 - 2021 Code Blue Activity



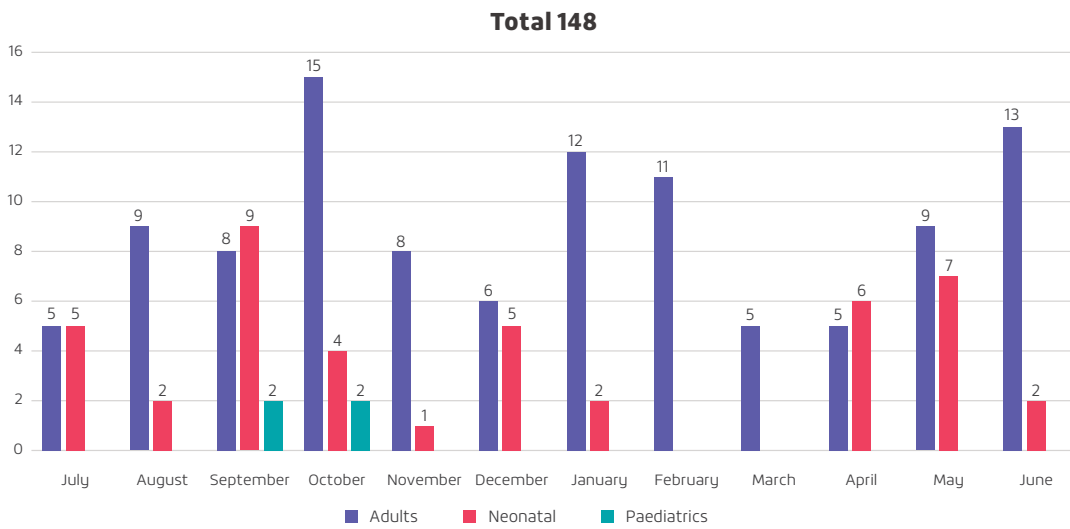
FY 2020 - 2021 MET Activity



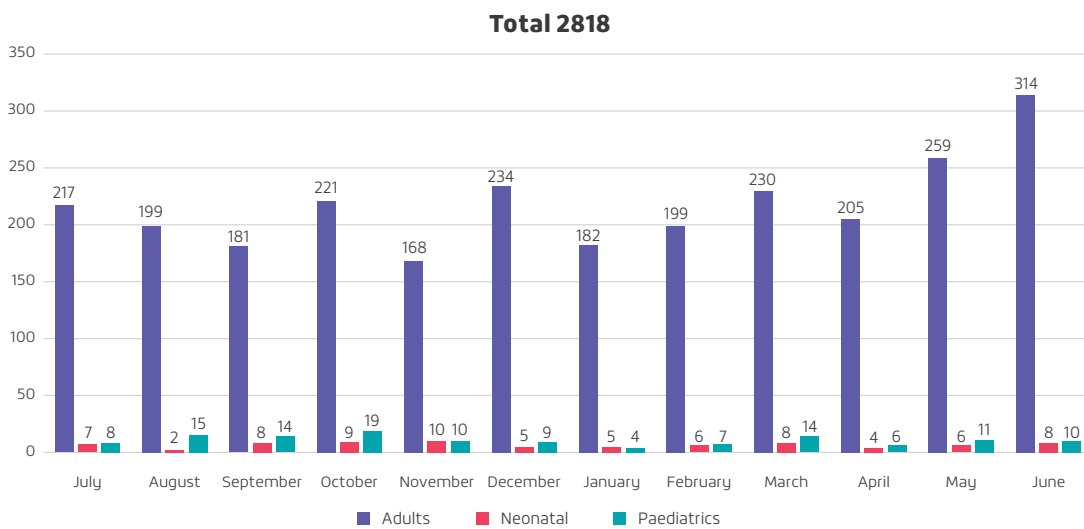
Financial Year 2021 – 2022

This year saw our busiest activity, both in the rapid response calls (2967), but also ward support due to the COVID-19 pandemic. In addition, two Patient and Carer Activated (PACE) calls in adults and one in paediatrics were called.

FY 2021 - 2022 Code Blue Activity



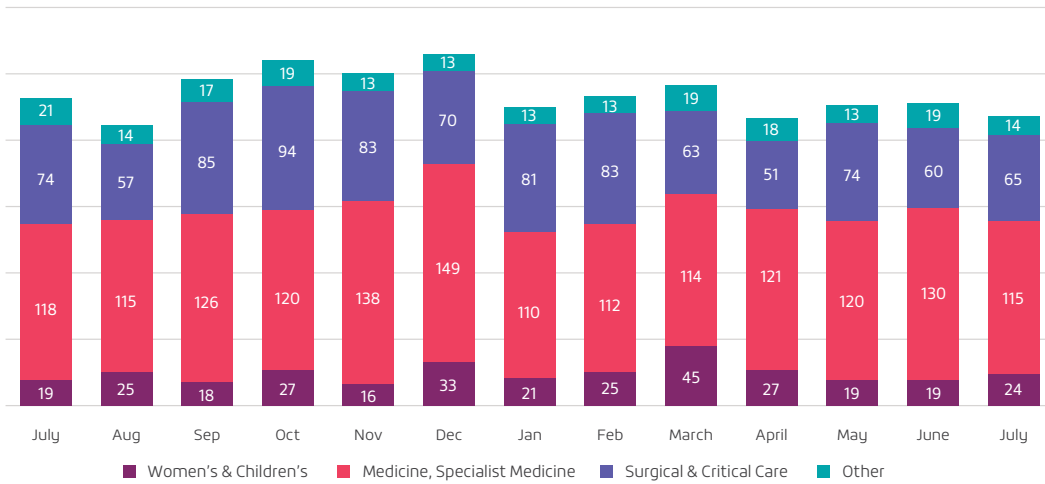
FY 2021 - 2022 MET Activity



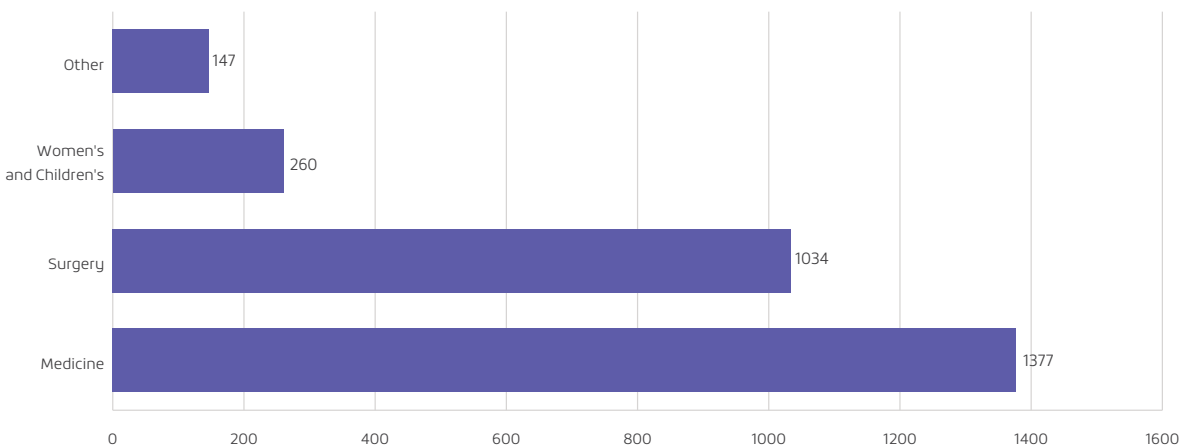
MET calls by directorate

The largest cohort of MET calls are triggered by the patients in the Medicine and Specialist Medicine Directorate.

FY 2020 - 2021 Met Calls by Directorate



FY 2021 - 2022 MET Activity by Directorate



Liaison Nurse Activity

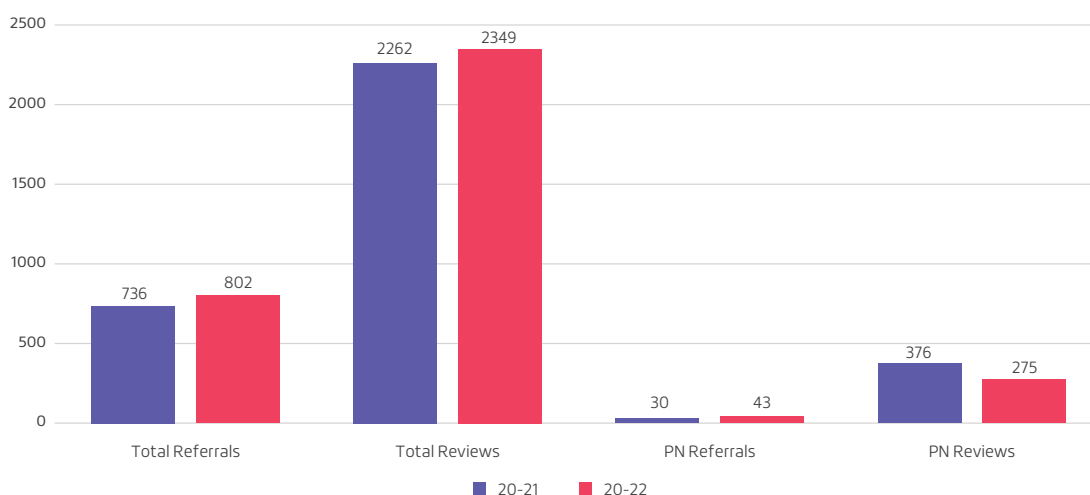
The liaison nurse activity has continued to grow over the past two years with increasing referral and review activity. This, along with a significant increase in the medical emergency calls over the same period, has been challenging. Increased FTE from November 2021 has assisted in the service ability to manage this.

As well as being an integral part of the rapid response team, the liaison nurse also provides senior critical care support and advice for the management of complex patient in the ward environment, including patients with a tracheostomy and those requiring parenteral nutrition.

This has been particularly important through COVID surge activity to ensure staff on COVID ward felt supported in caring for seriously ill covid patients requiring increased respiratory support in the ward environment.

The liaison staff are involved in the discharge planning and transitional care for many of the patients in ICU and provide discharge review to support continuity of care for patients and family.

Liaison Nurse Activity 2020-21-22



Education and Training

Young Surgical Centre Service Planning and Education Support

The ICU Liaison service was instrumental in preparing and educating nursing staff in the new Young Surgery Centre, which was opened in August 2022. The Rapid Access and Planning Unit and the Surgical Short Stay Unit were re-located, and being an off-site location required upskilling of ward staff in the recognition and initial management of the deteriorating patient. In addition, the service assisted in organising and development of delivery of the Rapid Response system to the new centre.

ICU Access Nurse MET Training

The liaison nurse team in collaboration with the ICU Education and Training team have developed an education program to support staff taking on senior nursing roles within the ICU. The ICU Access Nurse Education program was piloted in August 2021, incorporating information session to support the role of the access nurse in rapid response and ICU unit support. The focus of the program is communication and team training and included simulation training for MET response.

Evaluation of this pilot program will occur, and it is envisaged that this could be implemented more broadly to include junior medical staff in a multidisciplinary simulation model.

COVID ward support

The liaison nurse group provided additional clinical support and education to the COVID ward staff in managing seriously ill respiratory patients requiring increased respiratory support in the ward environment. During the peak COVID surges the outreach team rounded on the COVID ward daily to assist with recognising patient at risk of deterioration, ensuring early escalation of care and to provide to support to all staff.

We submitted a case for the provision of a telemetry based continuous oximetry monitoring for this cohort of patients to assist in the timely recognition of deterioration in a challenging clinical care environment.

Quality improvement

Code Blue Resuscitation Documentation

Review of Code Blue events through the medical emergency committee has revealed significant variability and inconsistency in how the Code Blue events with ALS are documented. There is limited use of the Medical Emergency Record currently in use across the organisation. In response, the ICU outreach team are facilitating the review and development of an adult and paediatric code blue resuscitation form to support the appropriate document of these emergency events.

Standardised Internal Emergency Call Number

The Victorian Health Department has initiated a program of work to use a single standard internal emergency number at all public healthcare sites in Victoria. Barwon Health is currently undertaking a project to facilitate the implementation of this process, which includes all internal emergency call across all sites including Code Blue and medical emergency at University Hospital. The outreach team is working with the project lead to ensure smooth transition of the change from *444 to *2222, including the identification and modification of all relevant procedures and forms to reflect this change.

Observation Monitoring Practices of Adult Patient after ICU Discharge

The ICU liaison nurse service is currently undertaking an audit to review the current practice of observation monitoring in the first 24 hours post ICU discharge. This audit is aimed at informing the effectiveness of current practice in recognising and responding to acute deterioration, as per the NSQHS standards and identify any recommendations for change to procedure to support patient safety.

Outreach SLIC module

The outreach team are working with the IT service provider to develop a comprehensive ICU OUTREACH module that will facilitate the capture of outreach service activities more accurately including rapid response activity, ICU referral activity and ICU liaison nurse activity.

The module, to be co-located in the current SLIC information system, will facilitate an accurate representation of current outreach activity for all users and allow for more consistent transfer of information on handover between outreach team members. It is anticipated that this will also provide some improvement in the awareness of outreach acuity and activity within ICU to assist with daily service delivery.

Accurate data collection of the activity of the outreach team will be utilised to provide support for service planning and in the development of business cases moving forward.

Organ Donation

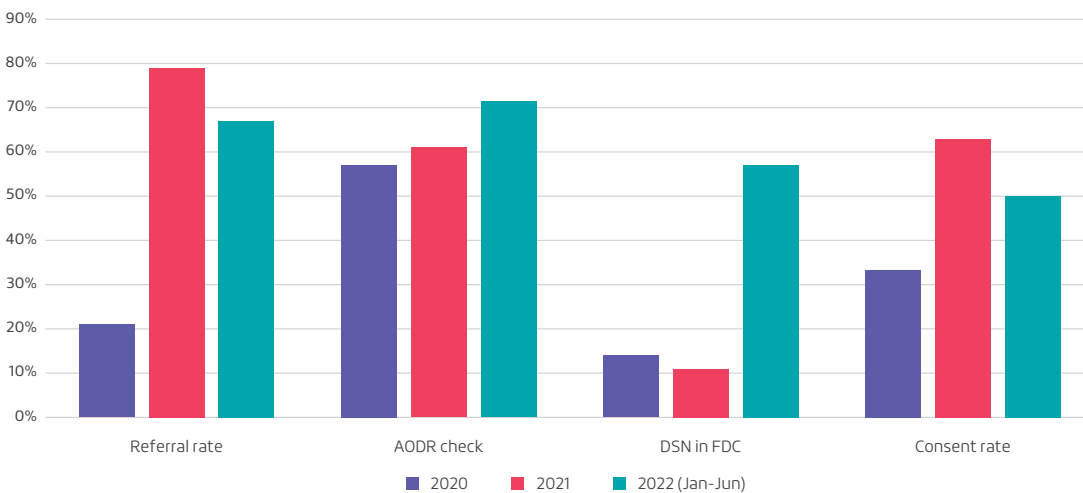
The organ donation team at University Hospital Geelong ICU is comprised of the medical donation specialist Dr Paul Power and nurse donation specialist Jo Kantianis. In collaboration with Donate Life Victoria, they work out of Intensive Care, to maximise access for our patients to organ and tissue donation through implementing the national strategies of the Organ and Tissue Authority Australia.

Since the beginning of 2020, 21 families have generously consented to organ and/or eye and tissue donation. We know that one incredibly generous donor can save up to 10 lives, but organ donation continues to be an infrequent event. Only 2% of people who die in hospital can become an organ donor.

Our ICU continues to overcome numerous challenges to deliver healthcare as we have in the past. The COVID-19 pandemic has greatly affected all health sectors, including organ donation. Despite this, our ICU has continued in their work to promote and explore the opportunity for organ donation for all our patients and families. The ICU team consistently refers patients at end-of-life care. This enables the Australian Organ Donor Register to be checked, along with determining medical suitability for donation in collaboration with Donate Life Victoria and ensures every opportunity to have a donation specialist nurse in a family donation conversation occurs.

The data below reflects the hard work by the entire ICU team in implementing the best practice guidelines for organ and tissue donation.

ICU Organ Donation Activity



Education - Medical

Throughout the COVID-19 pandemic, we provided six-monthly in-person orientation to the incoming or returning ICU registrars. These focused on the day-to-day management of an ICU patient role within the hospital rapid response service, an orientation to the unique systems within our unit and a brief introduction to the themes of organ supports provided.

Following a pause in the weekly education program in early 2020, it became clear that the effect of the pandemic was not going to abate and weekly sessions offering the possibility of virtual attendance were reinstated with a trend towards physical attendance over the two years.

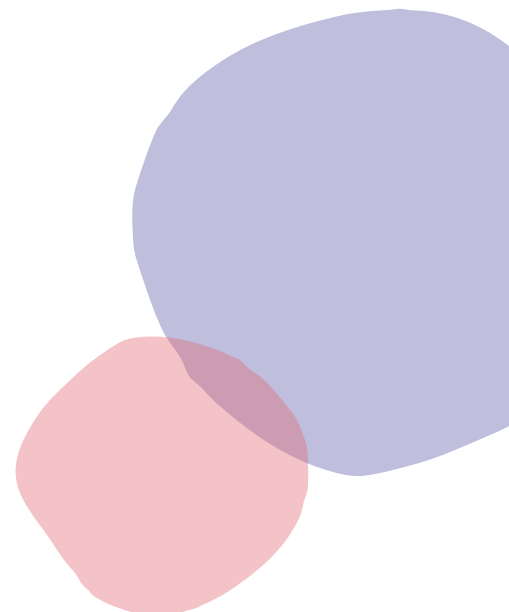
Additional monthly sessions have been implemented including:

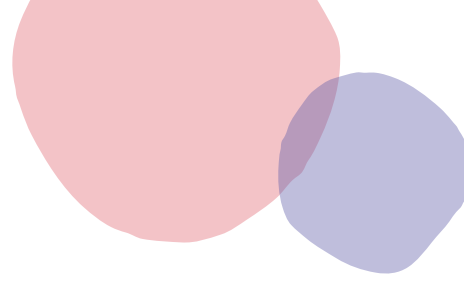
- › ECHO Club with David Green – for consultants and trainees alike to review and discuss relevant echocardiography studies within the unit for the preceding month. With cases forward to Dr Green beforehand, a theme identified, and subsequent discussion ensues.
- › Journal Club with Neil Orford – a review the literature relevant to intensive care medicine. The high impact and practice changing studies are put in context with previous studies in the form of a TRIP (translation of research into practice) to contextualize how the evidence has changed over time with a critical appraisal as to whether we should change practice in our ICU.
- › Fiji Case Discussions – a fantastic opportunity for connection with a Fijian ICU and for us to appreciate the complexity and challenge of providing intensive care a different resource setting. These sessions go a long way to continuing to support colleagues who have worked as trainees in Geelong and who are now working as Intensivists in Fiji.

Over the past two years we have seen several our trainees undertake the CICM primary exam with success. We continue to have good recruitment of basic and advanced trainees of CICM in our ICU. We also have trainees rotating from Emergency Medicine, Advanced Physician training and Anaesthesia.

Our unit has contributed to the “Hot Case Central” program run throughout Victoria, facilitating two Fellowship clinical exam candidates per week around the biannual exam schedule.

In addition to the above, all new medical staff are rostered to attend the iValidate course. This is a CICM endorsed, Barwon Health designed and run, two-day communication. This program highlights communication skills and having a patient-centred goals of care discussion with shared decision-making being the primary outcome.





Education - Nursing

The learning objectives of the University Hospital Geelong ICU Nursing Education Program include:

1. To produce a highly skilled motivated workforce.
2. To up-skill new RN/CCRN coming from other clinical/critical care areas.
3. To encourage a multidisciplinary approach to education.
4. To facilitate implementation of high-quality evidence-based healthcare.

The COVID pandemic of 2020 – 2022 has challenged the nursing education team to be dynamic and responsive. Facilitating quality education programs that are fit for purpose during a pandemic has been a challenge to overcome. Demand for up-skilling the ICU nursing workforce has been a priority and continues to have a significant impact on the ICU nursing education programs.

The focus is on ensuring all nurses working in ICU continue to develop their skills, knowledge, and expertise to deliver high quality evidence-based clinical care for all patients in the ICU.

2020-2022 ICU Nursing Education Program has included the following:

COVID education simulations, workshops and tutorials covering:

- › COVID/ARDS management
- › Prone positioning
- › Multi-disciplinary COVID intubation and extubation
- › New equipment including ventilators, haemofilters, monitors, CO monitoring

Required training and annual competency assessments:

- › All ICU nursing staff are required to successfully complete annual competency assessments in BLS, ALS, PLS and Smart Moves. An online assessment and face-to-face four hour study day format has been introduced and is now a requirement for all ICU nurses to attend.
- › The clinical service-training plan available on Grow allocates training requirements for all levels of nursing within the ICU. It also allows a platform for staff to undertake mandatory knowledge competencies, as well as opportunities for goal directed education for specific roles.

In-service program

- › ICU nursing education runs an in-service at least twice per week. This program includes simulations, tutorials, workshops, guest speakers and linking into external Zoom education. This education time is “protected”, an initiative commenced in 2020 and presently continues.
- › The challenge of learning whilst adhering to COVID considerations such as room limitations continues to be supported by the nursing staff.

ECMO training

- › ICU ECMO training and education has been handed over to the ECMO Clinical Nurse Consultant role in January 2022. Prior to this date the ICU education team was responsible for this program.
- › All ECMO trained nursing staff attend one four-hour study day per year, an initiative commenced prior to COVID.
- › In addition to the ECMO study days, all ECMO CCRNs all undertake a face-to-face annual competency.
- › The 2021 annual assessment includes an additional online knowledge quiz located on Grow.
- › Non-ECMO trained nurses have been able to attend the Alfred ECMO course which continues to increase the number of ECMO trained ICU nurses.

Paediatrics

- › The focus is on promoting and supporting the adult trained CCRN to develop and move through the paediatric up-skilling program and then continue to further develop their paediatric expertise.
- › The ICU Paediatric Foundations program commenced in 2022. It consists of:
 1. Online paediatric knowledge modules including quizzes on Grow. Staff receive access to these modules and complete them prior to attending the workshop day.
 2. The face-to-face workshop facilitated by the ICU education team aims are to develop skills and build on the participant’s theoretical knowledge. Topics include admission to ICU, ventilation, bubble CPAP, HFNC, medication administration and preparation and patient assessment.
 3. Prior to 2022 this “three phase” workbook and tutorial/assessment programs were delivered adhoc during rostered clinical shifts.

- › APLS training day was postponed during the pandemic. This has now recommenced with staff attending in September 2022.
- › Paediatric in-services, simulations, and workshops

Access Nurse / MET training August 2021

- › Six-hour study day with collaboration with the communications education team

ICU post graduate students

- › The 2022 ICU post graduate course continues to be partnered with Monash University and now has a large cohort of 12 students. In 2021 there were seven students.
- › The postgraduate program is delivered with the students attending university workshops via Zoom and accessing the online learning platform.
- › The ICU CNE complement Monash by running 8-hour study/workshop days, completing summative and formative clinical case studies and appraisals. Clinical competencies are also completed by the ICU CNE.
- › Students are also supported at the bedside with theoretical application to practice daily.

ICU Discovery Program

- › In August 2020, we introduced a nursing ICU discovery program which enabled RNs without critical care experience a six-month introductory program in ICU.
- › In 2022, the program has been modified to include five eight-hour study days in the six-month program. These study days were designed and are facilitated by the ICU Education team. The feedback from participants attending these days has been extremely positive.
- › Program which consists of the following components:
 - Online theory modules
 - Eight-hour study days,
 - An activities workbook
 - Formative and summative appraisals
 - Daily application of theory to practice at the bedside with CNE/CSN
- › Prior to 2022, this program was run as tutorials during rostered clinical shifts.

Study Days

- › In 2022, four hour "hot topic" study days have been introduced.
- › Topics for 2022 include CRRT, pacing, and ALS as selected by the ICU CCRNs

Interdisciplinary education:

- › The interdisciplinary education with ICU doctors and nurses includes:
 - COVID workshop and simulation sessions
 - ECMO study days, didactic, and simulation sessions
 - Paediatric procedures/skills and simulation

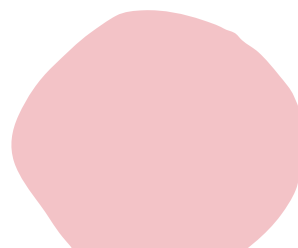
Inter-departmental education:

ICU nurses and doctors have participated in:

- › PROMPT: Practical Obstetric Multi-Professional Training
 - Quarterly sessions of an evidence-based multi-professional training package for obstetric emergencies.
 - Medical and nursing staff from ICU, anaesthetics, and obstetrics participated in this all-day teaching session.
 - ReVISE Supersession program is a multi-disciplinary simulation program with nursing and medical participants from ICU, Emergency, Anaesthetics, Paediatrics and Surgery.
 - The Regional Victorian Institute of Simulation Education coordinates and delivers the program, with four sessions a year.

During 2020-2022, these programs had to be postponed due to restrictions.

The ICU nursing education team continues to be involved in the ongoing review of ICU PROMPT guidelines, development of learning resources, the creation and updating of learning modules and competency skills and knowledge packages.



Nurse Unit Manager

The past two years have been a challenging time for the Intensive Care Unit as the COVID 19 pandemic continued to place demand on the health system for ICU beds. Through the Delta and Omicron waves, the nursing workforce has risen incredibly well to the challenge, as have all members of the ICU team.

The nursing workforce has proven to be a valuable asset to the organisation as the daily demand for ICU beds and staff rose each and every day for several months. Staff have shown incredible resilience and compassion for each other, their patients and commitment towards their profession.

The past 12 months has provided three of the Associate Nurse Unit Managers the opportunity to take on the role of Acting Nurse Unit Manager as a rotational secondment. They have been innovative in their development of a COVID pod, flexibility in rostering and approach to delivering care with new members of staff brought into the team to assist.

Recruitment has been essential and continues to be a major challenge to ICUs across Victoria. There is currently a high vacancy rate as recruitment and orientation for new staff continues. The ICU employs 158 registered nurses, with 80% of staff holding a critical care certificate. As the demand for ICU beds and staff has grown, ICU is committed to the Barwon Health strategic plan "grow your own" by increasing the ICU graduate certificate student numbers next year and implementing strategies to provide support and education to all members of the team to increase retention. To provide an increase in student numbers, the ICU education team has grown to accommodate and support all staff.

Wellbeing

Staff have been encouraged to take regular leave breaks throughout the year due to the demands of the pandemic on the ICU nursing workforce. Many staff had delayed annual leave due to travel restrictions resulting in high leave accumulation. All nursing staff annual leave has been reviewed and any staff without leave for 2022 have been encouraged to submit annual leave requests.

Staff have participated in several group wellbeing initiatives including R U Ok? day, facilitated debriefs and wellbeing sessions offered through the EAP program.



ICU Nurse Unit Manager Donna Robertson

Representation

The staff of UHG ICU are committed to “giving back” to the critical care community, through representation on state and national bodies, education, or philanthropy.

- › **College of Intensive Care Medicine: Board Member; Chair Hospital Accreditation Committee; Chair of Culture Program:** A/Prof Neil Orford
- › **College of Intensive Care Medicine: Welfare Committee; PROEMS SIG:** Dr Nicholas Simpson
- › **College of Intensive Care Management Course Faculty:** Dr Claire Cattigan
- › **College of Intensive Care Communications Course Facilitator:** Dr Nima Kakho
- › **Australian and New Zealand Intensive Care Society: CTG – Project review; Abstract review Committee:** Dr Matt Maiden
- › **Donate Life Barwon Health Medical Director:** Dr Paul Power
- › **Victorian State Trauma Outcomes Registry and Monitoring Group:** Dr Matt Maiden
- › **ICU Cluster Leads COVID-19 Planning:** Dr Claire Cattigan
- › **Victorian ICU Directors Group:** Dr Claire Cattigan (Chair), Dr Matt Maiden, Dr Nima Kakho
- › **Alfred Intensive Care ECMO Instructors:** Dr David Green, Dr Joe McCaffrey, Dr Martina Ni Chonghaile
- › **Alfred Intensive Care Waveforms and Ventilator Workshop Instructor:** Dr Ash Garnett
- › **Safer Care Victoria ECMO (VECMOS) Working Group:** A/Prof Neil Orford, Dr Martina Ni Chonghaile, Dr Joe McCaffrey, Dr Nima Kakho
- › **VECMOS Governance Committee:** A/Prof Neil Orford, Dr Martina Ni Chonghaile
- › **VECMOS Data and Research Committee:** A/Prof Neil Orford
- › **VECMOS Executive:** Dr Martina Ni Chonghaile
- › **VECMOS Education Subcommittee:** Dr Nima Kakho, Ms Lucy Range
- › **VECMOS Site Initiation and Accreditation Subcommittee:** Dr Martina Ni Chonghaile
- › **Open Heart International Volunteer Intensivist:** A/Prof Neil Orford, Dr Nicholas Simpson, A/Prof Charlie Corke, Dr Joe McCaffrey, Dr Nima Kakho
- › **Victorian Assisted Dying Review Board, Deputy Chair:** A/Prof Charlie Corke
- › **Critical Care Collaborative Network:** Ms Donna Robertson

