

Executive Summary

ICU plays a key role as an essential general clinical support service, underpinning and backing up all other clinical services throughout each major hospital.

ICU services in Tasmania are delivered by highly skilled, multidisciplinary teams across the Royal Hobart Hospital, Launceston General Hospital and North West Regional Hospital. The Mersey Community Hospital provides High Dependency services.

Intensive Care services face a number of sustainability issues and challenges which are detailed in this report. This report makes a number of recommendations in response to those issues and challenges.

The Intensive Care CAG has identified a number of improvements to the service profile presented in the draft Tasmanian Role Delineation Framework (TRDF) which are detailed in Attachment A.

The future of intensive care services in Tasmania is dependent on the final Tasmanian Clinical Services Profile (TCSP).

The resources and role delineation level of ICUs in each region should ultimately reflect the range and level of other clinical services, with respect to the risk of misadventure, acute deterioration, or complications of treatment or surgical/medical procedures. Services should only occur in hospitals where an appropriate level of ICU support is available as per the TRDF.

The CAG is supportive of reform efforts and wants to engage with service planners on the implementation of the TCSP – particularly around ensuring ICU services can support other services changes in the Tasmanian health system.

Recommendations

This report makes a number of recommendations to improve the quality, safety and sustainability of intensive care and high dependency services in Tasmania:

Recommendation 1

That the Intensive Care CAG continue beyond this current process to oversee ICU and high dependency activity, including the number of beds, quality of care, efficiency, and uniformity of clinical practice. The scope should incorporate inter-hospital transport, trauma, utilisation and cost of interstate intensive care beds, training and education, and models for a sustainable ICU workforce.

Recommendation 2

That the governance relationship between the Intensive Care CAG and the Executive of the THS should be formalised, to enable clinical advice from the CAG to be used to help inform necessary changes to the intensive care and high dependency clinical services offered at Tasmania's hospitals.

Recommendation 3

That all Tasmanian ICU and High Dependency beds be incorporated into a network to allow appropriate transfer and management of patients depending on the allocation of services under a single THS. This network would ensure consistency of practice across the THS and ensure best price purchasing for commonly used drugs and devices.

Recommendation 4

That following the determination of the TCSP, the Intensive Care CAG should be tasked with mapping the impact of TCSP changes on ICU services around the state in order to understand future workload and service needs. In particular noting that changes to trauma services and the redistribution of surgical caseload may impact on the RHH and LGH ICU demand.

Recommendation 5

That systems and staffing models should be consistent and appropriate to the ICU level in all hospitals that have an ICU or HDU, and these must include medical, nursing, and allied health staff. ICU staffing and activity must be regarded as a 365 day service, and outcomes should not be influenced by public holidays or weekends.

Where staffing levels at a hospital do not match the workforce requirements of the designated ICU level, a commitment must be made to ensure staffing levels are brought to levels consistent with the TRDF over the course of the budget forward estimates.

Recommendation 6

That a dedicated ICU website for Tasmania be developed in order promote education, research and training opportunities and publish outcomes with the view to improving the profile of our ICUs, and increasing the quality of applications for local ICU-based positions.

Recommendation 7

That appropriate transport systems are established to allow retrieval of patients when required. These systems need to be tailored to support hospitals without ICUs or HDUs, and be responsive to direct the patient to the most appropriate hospital where an ICU bed is available within clinically appropriate time-frames.

Recommendation 8

That where support services (e.g. anaesthetics, pathology, pharmacy and radiology) are not provided at the role delineation level required to support the provision of ICU services under the TCSP, a commitment must be made to invest in support services over the course of the budget forward estimates to ensure they are provided at the appropriate role delineation level.

Recommendation 9

That a statewide drug information service is developed and operated at a minimum of 5 days per week.

Recommendation 10

That funding transparency is improved between the DHHS and THS through the provision of relevant data. This data should be used by the CAG and hospital administrators to ensure that practices are efficient, and that caseload is managed appropriately.

Recommendation 11

That the THS determine systems to ensure that appropriate cost shifting occurs to accurately reflect the cost of care incurred by the receiving hospital for any patient that is transferred.

Recommendation 16

That local and statewide disaster plans be developed, in consultation with all relevant CAGs, which includes guidelines for managing surge capacity and ICU bed management.

Recommendation 12

That consideration is given to costing ICU activity back to the various business units of the THS.

Recommendation 17

That the THS support adequate numbers of nurses undertaking critical care training in order to ensure sustainability of the critical care nursing workforce.

Recommendation 13

That statewide agreement is established among hospital bed management systems to prioritise the transfer of ward ready patients out of ICU to prevent bed block of available/funded ICU beds.

Recommendation 18

That the THS explore the possibility of a statewide rotation of registrars training in intensive care.

Recommendation 14

That the number of ICU beds in each hospital be mandated by the THS under advice from the ICU CAG.

Recommendation 19

That a business case be developed (with input from the Intensive Care CAG) to enable a statewide clinical information system to be implemented which will support ongoing professional development, opportunities for peer review and the sharing of clinical information.

Recommendation 15

That a transparent statewide ICU bed management system be developed to enable patients to be transferred to the most appropriate centre, and should be accessible by Ambulance Tasmania, and the retrieval coordination service.

Recommendation 20

That the option of an extended ICU liaison nurse service be investigated at the RHH and LGH hospitals.

Recommendation 21

That in circumstances where a private patient requires ICU or HDU, this service should be managed and provided within the private sector. The THS must make a concerted effort to negotiate a higher ICU bed day fee for private patients occupying a public ICU bed, as the private funding is significantly lower than required.

Recommendation 22

That following the determination of the final role delineation framework and Clinical Services Plan, partnerships with the private sector is explored to potentially develop units of excellence that could include publically funded patients at a discounted cost.

Recommendation 23

That systems be explored to ensure that nurses working in private ICUs can have access to educational resources and potentially secondment to the public ICU in order to maintain skills.

Recommendation 24

That the proposed changes to the Intensive Care Units and High Dependency Units (Attachment A) be accepted.

Introduction

Australia has world class standards of Critical Care medicine and is a world leader in clinical research and safety and quality in Critical Care. Standards in Tasmania are the same, and all Intensive Care Units (ICUs) monitor performance utilising the national CORE (Centre for Outcome and Resource Evaluation) database which reports on outcomes, including against national benchmarks.

ICUs play a key role as an essential general clinical support service, underpinning and backing up all other clinical services throughout each major hospital.

This role is highlighted by the Australian Commission of Safety and Quality in Health Care (ACSQHC) requiring ICU-led support structures for deteriorating patients.¹ In this respect ICU services are unique when compared to the other four 'support services' described in the Tasmanian Role Delineation Framework (pathology, pharmacy, radiology and anaesthetics).

The resources and role delineation level of ICUs in each region should ultimately reflect the range and level of other clinical services, with respect to the risk of misadventure, acute deterioration, or complications of treatment or surgical/medical procedures. Services should only occur in hospitals where an appropriate level of ICU support is available as per the Tasmanian Role Delineation Framework (TRDF).

The College of Intensive Care Medicine (CICM) has developed standards and accreditation for all ICUs and Tasmania should adhere to these guidelines if we wish to achieve the goal of having "the healthiest population in Australia by 2025, and a world-class health care system

¹ Australian Commission on Safety and Quality in Healthcare, *Standard 9: Recognising and Responding to Clinical Deterioration in Acute Health Care* (2012). Available online: http://www.safetyandquality.gov.au/wp-content/uploads/2012/10/Standard9_Oct_2012_WEB.pdf

where people get treatment and support when they need it.”²

About the CAG

The Intensive Care CAG was established in late 2014. The CAG is convened by Dr Andrew Turner.

The role and function of the CAG is to:

- provide the expertise and experience for the development of evidence-based clinical advice on discipline specific statewide issues including as part of the planning and implementation of reform efforts;
- undertake and facilitate effective clinical engagement;
- provide reports on specific issues as requested; and
- undertake programs of work identified by the CAG and agreed to by the Convenor

Recommendation 1

That the Intensive Care CAG continue beyond this current process to oversee ICU and high dependency activity, including the number of beds, quality of care, efficiency, and uniformity of clinical practice. The scope should incorporate inter-hospital transport, trauma, utilisation and cost of interstate intensive care beds, training and education, and models for a sustainable ICU workforce.

Recommendation 2

That the governance relationship between the Intensive Care CAG and the Executive of the THS should be formalised, to enable clinical advice from the CAG to be used to help inform necessary changes to the intensive care and high dependency clinical services offered at Tasmania’s hospitals.

² Tasmanian Government, *Delivering Safe and Sustainable Clinical Services – Green Paper* (2014). Available online: http://www.dhhs.tas.gov.au/_data/assets/pdf_file/0006/179052/141208_vF_OHS_GreenPaper.pdf, page 5.

Overview of current services

Within the public system ICU beds exist in the three major hospitals, and a High Dependency Unit operates within the Mersey Community Hospital (MCH).

National data suggests that Tasmania should have around 40 Intensive Care beds, shared between public and private sectors.³

At present only Calvary Healthcare has an ICU at the Lenah Valley campus and this contributes around 5 beds to the total ICU stock.

The total number of staffed ICU beds at present are 12 within the Royal Hobart Hospital (RHH), 9 within the Launceston General Hospital (LGH), and 3 within the North West Regional Hospital (NWRH), and a 4 bed HDU within the MCH staffed to a level that could provide 2 ICU beds. The RHH bed numbers are not supported by the hospital budget, and the ICU consistently creates a loss for Clinical Services Medicine of around \$1.8 million.

Royal Hobart Hospital

The Department of Critical Care Medicine at the RHH provides ICU services at role delineation level 6 (CICM level 3). The Department has been accredited by the CICM as “unlimited, cardiac” for advanced training in intensive care medicine.⁴

The ICU cares for patients admitted with a wide range of conditions including acute medical and surgical (General and Specialist), neurosurgical,

cardiothoracic, trauma, and major burns. Spinal rehab and organ transplant patients are referred interstate.

The Unit is staffed by 6.15 FTE Staff Specialist Intensivists, 2 FTE Senior Registrars, a Career Medical Officer, 5 FTE Registrars and 5 FTE Resident Medical Officers. Nursing staff includes Clinical Nurse Consultants, Nurse Unit Manager, Clinical Educators and Clinical Nurses and support for post-graduate nursing training in critical care nursing. The ICU provides an outreach liaison service Monday to Friday day hours only, through a dedicated CNS position.

The ICU also provides unfunded Rapid Response Team (RTT) support for Medical Emergencies and Code Blue. The RRT activity has had a negative impact on junior medical staff training in ICU and on patient safety within the ICU particularly overnight. While these issues are acknowledged by management, they are regarded as unfixable in the current economic climate. The ICU also supports both Brain Dead and Post Circulatory Death pathways for organ donation.

Allied Health staff includes dedicated Pharmacist, Physiotherapist, and fractional Social Work and Dietician all of whom predominantly work day hours Monday to Friday. The Unit is also supported by the hospital orderlies and a dedicated ward clerk.

A redevelopment has recently seen bed numbers increase to 25, of which only 14 are staffed, with an allowed budget deficit set to \$1.8 million. The true budget without deficit is set to 10 staffed beds only. At times patient numbers may increase to 18 or more, as the ICU does not transfer or refuse emergency admissions. The median number of patients in ICU last calendar year was 13. The RHH has recently decided that the ICU nursing establishment should be reduced in an attempt to reduce this deficit, which will likely impact on bed numbers, or overtime requirements for those nurses remaining on establishment. Should bed numbers decrease there will likely

³ Australian and New Zealand Intensive Care Society: Centre for Outcomes and Resource Evaluation, *Intensive Care Resources and Activity Report 2010-11*, (Carlton: ANZICS CORE, 2013), page 7.

⁴ See CICM Website for definitions of these classifications: <http://cicm.org.au/Hospitals/Accredited-Sites-Accordion/Accredited-Units>.

be an increase in elective surgery cancellations, or a requirement to transfer patients to other ICU beds within the state.

With respect to the recent increase in bed numbers in ICU at RHH, the 11 brand new bed-spaces are designed to acceptable CICM standards for space and layout. The 14 bed-spaces in the older part of the ICU are significantly undersized and are inadequate for complex ICU patients and the necessary equipment to support them. These patient beds extend out into the corridor which affects patient privacy and creates infection control problems, and access to the patient airway in emergencies is severely limited. These are recognised to pose patient safety risks. There is design work ready for this to be remedied but it is presently not part of the redevelopment at RHH.

The ICU has around 1200 admissions annually and has periods of extended time where nursing double shifts are required to staff the patients located within the ICU and any emergency admissions. The RHH ICU does not transfer patients inter/intrastate other than patients requiring spinal rehabilitation or organ transplantation. However the RHH may decant occasional patients to the private ICU when a bed is available, the family are agreeable and funding is guaranteed so that the patient will not incur a cost.

Elective surgery, including cardiothoracic surgery, may be cancelled due to the lack of available and staffed ICU beds. This has been mitigated somewhat by an agreement that the first case for both cardiothoracic surgery and elective surgery, will proceed unless the ICU is under severe duress. However, this decision has had an ongoing impact on the ICU budget deficit.

The ICU also provides an inpatient and outpatient parenteral nutrition service, with training and support from the ICU dietician and vascular access nurse.

The ICU has an N Class Isolation Room, and will have a Q Class Isolation in the foreseeable future. It is the only quarantine ICU in the state and would be responsible for managing outbreaks of Ebola or SARS should they occur in Tasmania.

Paediatric ICU Services

There is a single Paediatric ICU in Tasmania which is part of the Neonatal and Paediatric ICU (NPICU) based in Hobart at the RHH. Patients up to age 15 are admitted, occasionally older if there is an underlying chronic condition. Approximately 150 paediatric patients per year are admitted in addition to around 450 neonates.

The vast majority of paediatric patients needing ICU care are looked after in the RHH NPICU, with a few transferred to Melbourne (mainly for cardiac care). Occasionally children are still admitted to the adult ICU in Hobart for various reasons where their medical care may be managed by paediatric intensivists often alongside adult intensivists. There is a close working relationship between the two departments. A very small number of paediatric patients may spend short periods of time in the adult ICUs in Launceston or Burnie.

For patient safety ideally all patients in Tasmania who are under 15 years of age and needing Intensive Care or High Dependency Care support should be managed in consultation with the NPICU Consultant on call at the RHH, regardless of the patient's location. The decision to transfer a patient to the NPICU should be the responsibility of the paediatric intensivist. At present there are no specific protocols which ensure these requirements, and other Clinical Advisory Groups and working groups are currently considering this issue.

Transfer of paediatric ICU patients within (or out of) the state is undertaken by the NETS/PETS service based in the NPICU or by the adult

retrieval service (AMMRD) if a paediatric capable flight doctor is available. All such patients should be discussed jointly by the NETS/PETS and adult retrieval coordinating consultants on call. Ambulance Tasmania Flight Paramedics will accompany the patients alongside a doctor from the PETS service or AMMRD, and a nurse from the NETS/PETS service as required.

Launceston General Hospital

The Intensive Care Unit at the Launceston General Hospital (LGH) provides ICU services at role delineation level 5 (CICM level 2), and is classified by CICM as “unlimited” for advanced training in Intensive Care Medicine.⁵

The ICU provides multisystem organ support for patients admitted with a wide range of conditions including acute medical, surgical (General and Specialist), and trauma patients (major trauma and head trauma is transferred after stabilisation). Cardiothoracic surgery, neurosurgery, major burns, and non-urgent vascular surgery patients are transferred to the RHH. Spinal rehabilitation and organ transplant patients are referred interstate. Patients initiated on VV-ECMO for pulmonary failure are managed locally by ECMO credentialed nurses (22 staff). Patients initiated on emergency VA-ECMO for circulatory failure are referred unless deemed unsupportable or unsurvivable.

The Unit is staffed by 3 FTE Staff Specialist Intensivists (and an additional equivalent of 0.7 FTE rotating from the LGH Department of Anaesthesia) to provide 24/7 consultant cover. Five registrars provide 24 hour cover. Until recently 4 FTE registrar positions were also allocated to the Unit from the statewide retrieval service to provide them with skills and

training while not undertaking retrievals. However, this has recently decreased to one FTE who attends ICU if not flying during normal working hours. Three resident medical officers are also allocated to the Unit and are rostered on to provide 8am to 10pm coverage.

THE LGH ICU additionally supports hospital-wide provision of short and long term vascular access, parenteral nutrition delivery and deteriorating patient programs and high risk clinic patient review (outpatient clinics on referral from anaesthetists and/or surgeons). When required the LGH intensivists also travel to the north west campuses to retrieve or give second opinions on patients.

Nursing staff include a Nurse Unit Manager, Clinical Nurse Educator, and Clinical Nurses with each shift having a rostered in-charge, access and MET nurse supporting patient allocated nurses. The Unit has excellent access to allied health resources including a strong physiotherapy team with active interest in critical care research and techniques.

The LGH ICU has recently been redeveloped and currently has 18 bed spaces, with 14 physical beds. Two beds are isolation beds and 4 are fitted for bariatric patients. There is nurse staffing for 11 beds (officially 7 ICU and 4 HDU beds).

The LGH ICU has variable ability to treat paediatric patients or hold short term for transfer. There is one paediatric-trained intensivist at the LGH, supported by a number of anaesthetists with paediatric skills and the RHH NPICU.

The Unit has excellent relationships with the RHH and Melbourne quaternary institutions when acuity exceeds what can be provided in Tasmania.

⁵ See CICM Website for definitions of the classifications: <http://cicm.org.au/Hospitals/Accredited-Sites-Accordion/Accredited-Units>.

North West Regional Hospital

The North West Regional Hospital (NWRH) ICU is an eight bed, level 4 Unit which services Intensive Care, Coronary Care and Medical/Surgical/Paediatric High Dependency patients, providing critical care services to the North West and West Coasts of Tasmania. The NWRH is classified by CICM as “Foundation, Rural”.⁶

The NWRH ICU covers a large range of Intensive Care services with the general case-mix of patients including trauma patients, sepsis and multi-system failure, post-operative complications, unstable angina/AMI, cardiac arrhythmias, and respiratory failure.

Medical staff includes Staff Specialists (one intensivist, who is the Unit director, and the remainder being Anaesthetists with intensive care experience) and Resident Medical Officers (Critical Care). Nursing staff includes a Nurse Unit Manager, Clinical Nurse Specialist - Intensive Care Liaison, and Clinical Nurses.

Mersey Community Hospital

The High Dependency Unit (HDU) at the Mersey Community Hospital (MCH) has been functioning for a number of years after closure of the ICU in 2007. It was established to care for patients who need a high level of monitoring, including single organ failure that is expected to improve within a short timeframe.

Medical staff in the HDU are generalist specialist clinicians and not intensivists. The HDU has a Medical Director, with medical teams from the Department of Medicine and Department of Surgery also providing daily patient ward rounds. Anaesthetic support is available for insertion of lines in cases where invasive

haemodynamic monitoring is required before the patient can be safely retrieved to an ICU.

Staffing includes 20 Registered Nurses (RN) who maintain skills through simulation sessions which are provided and arranged by the Clinical Nurse Educator for the HDU. A number of nursing staff have taken part time positions at LGH to maintain skills.

Generally patients will only be managed in the HDU for a period of up to 72 hours. If a patient's condition is not substantially improving by 72 hours they will be transferred to a hospital with an ICU for ongoing care.

The MCH HDU can communicate and consult with NWRH/ICU clinicians via phone or videoconference facilities to discuss cases and ongoing management to ensure safe outcomes for patients. It is also possible for NWRH clinicians to attend the MCH and accept the ongoing management of the patient. However, these situations are rare.

Recommendation 3

That all Tasmanian ICU and High Dependency beds be incorporated into a network to allow appropriate transfer and management of patients depending on the allocation of services under a single THS. This network would ensure consistency of practice across the THS and ensure best price purchasing for commonly used drugs and devices.

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Issues

There are a number of issues and challenges impacting on the delivery and sustainability of ICU services in Tasmania. These include caseload, workforce, support services, transport / transfer / retrieval, funding, bed management, education and training, safety and quality and relationship with private hospitals. This section discusses those issues and challenges and makes a number of recommendations to ensure the sustainability of ICU and HDU services in Tasmania.

Caseload

Caseload at the RHH ICU includes statewide emergency neurosurgery, (which if time critical for intervention, arrives at the RHH regardless of whether an ICU bed is available), cardiothoracic surgery, major burns, high risk obstetric, and cases requiring hyperbaric support. Forty-five percent of admissions to the ICU are elective of which roughly half are cardiothoracic, and half major surgery; 15% of admissions are sourced directly from other hospitals around the state; and 28% of admissions are direct from the emergency department. A total of 25% of all admissions are from patients who reside in the North and North West of the State.

At the LGH particular challenges relate to providing staffed beds to support local elective surgery throughput and local emergency demand while also being the primary referral centre for general ICU patients that exceed the availability of staff and/or equipment at the NWRH. These resource allocation difficulties have been accentuated by the recent closure of two LGH coronary care beds, with the ICU more frequently taking emergency coronary care patients. This load is reflected in a high after-hours discharge rate and occasions when accepted ICU patients remain in the Emergency Department beyond acceptable time periods.

At the NWRH high acuity volume has decreased such that the Unit has cared for only around 100 ventilated patients per year for the past 3-5 years. In this time specialist numbers have reduced and the dependence on locums has increased, making service sustainability challenging.

The MCH HDU supports both medical and surgical high dependency patients, and includes coronary care type patients. Basic haemodynamic support and monitoring is available as well as non-invasive ventilator support. Medical cover is physician-based, and the Unit is predominantly staffed by nurses who are responsible for monitoring vital signs, and alerting medical staff to a deterioration.

The long term viability of the model at the MCH is unclear and changes will have implications for ICU and CCU/Cardiology services across the state.

The resources and role delineation level of ICUs in each region should ultimately reflect the range and level of other clinical services, with respect to the risk of misadventure, acute deterioration, or complications of treatment or surgical/medical procedures. Services should only occur in hospitals where an appropriate level of ICU support is available as per the TRDF.

Recommendation 4

That following the determination of the TCSP, the Intensive Care CAG should be tasked with mapping the impact of TCSP changes on ICU services around the state in order to understand future workload and service needs. In particular noting that changes to trauma services and the redistribution of surgical caseload may impact on the RHH and LGH ICU demand.

Workforce

Staffing models within Tasmania are problematic as each ICU is effectively isolated, and there is marked variability in staffing requirements at peak and trough periods of activity.

Seasonal fluctuations in ICU activity, such as over Christmas/New Year when little elective surgery occurs or during flu season (when staff may also be on leave with illness themselves or caring for children with illness) compound staffing challenges, despite being reasonably predictable year on year.

Interstate ICUs tend to enjoy greater economies of scale, an ability to transfer patients to other ICUs within the same city, and an ability to utilise skilled agency based nurses – all of which tend to balance ICU activity. For example, the ability to utilise agency nurses, means nursing staff can be booked to supply a fixed percentage of ICU beds, but then cancelled at short notice if the ICU bed requirement is low. This allows for periods of high activity to be properly staffed, with savings during periods of low activity.

Currently the two major ICUs in Tasmania (the RHH and the LGH) are not adequately resourced for the services they provide. They both run predominantly on the goodwill of nursing staff to undertake 'double shifts' rather than address the fundamental staffing requirements needed to meet elective demand and immediately respond to emergencies.

Allied health services are an essential part of the multidisciplinary team in the ICU and face the same issues around recruitment and available staffing that medical staff and other clinical areas have. Like all emergency care there is a 24 hour requirement for these services, particularly in the critical care setting for social work and physiotherapy.

A level 5 or 6 ICU must be able to operate 365 days per year, and at present allied health services tend to operate predominantly Monday to Friday with diminished weekend support.

Physiotherapy services across the THOs have been rationed and this leads to delays to patient mobility, discharge and increases length of stay (LOS).

Recommendation 5

That systems and staffing models should be consistent and appropriate to the ICU level in all hospitals that have an ICU or HDU, and these must include medical, nursing, and allied health staff. ICU staffing and activity must be regarded as a 365 day service, and outcomes should not be influenced by public holidays or weekends.

Where staffing levels at a hospital do not match the workforce requirements of the designated ICU level, a commitment must be made to ensure staffing levels are brought to levels consistent with the TRDF over the course of the budget forward estimates.

Medical staff recruitment remains challenging in Tasmania. Each year this is becoming increasingly so for the ICUs at the RHH and the LGH, and presents sustainability issues for these ICUs, and hence for other services that require ICU support.

Recruitment issues may involve remuneration, perceptions that Tasmanian ICUs are not of a similar standard to major Australian city ICUs, lifestyle and rostering issues. In particular there is nearly no capacity to cover unexpected leave without working beyond widely recognised safe working hours. The requirement and preference of high tier trainees to go to major quaternary centres and a widely acknowledged lack of upcoming local consultant jobs also discourages CICM advanced trainees from remaining in the state.

Most major interstate ICUs have associated webpages which are of a high quality and promote the profile of the ICU to trainees from interstate and overseas. There are inadequate support/systems for Tasmanian ICUs to have similar professionally developed web pages.

Recommendation 6

That a dedicated ICU website for Tasmania be developed in order promote education, research and training opportunities and publish outcomes with the view to improving the profile of our ICUs, and increasing the quality of applications for local ICU-based positions.

Transport, transfer and retrieval

Currently transport is a barrier to the safe provision of care. For example, the MCH is only able to treat low acuity patients, however, when bed block is occurring in other hospitals this can mean the MCH must manage the care of a patient who should have been transferred to a more acute facility. Transfer to and from hospitals with low service acuity needs to be streamlined to match the acuity of the patient. The safety of any high acuity patient must override receiving hospital bed considerations.

Transport, transfer and retrieval services in Tasmania will need to be strengthened and improved if there are to be significant service changes in order to facilitate a rapid, safe and effective transfer of patients to receiving ICUs for escalation of their care.

Recommendation 7

That appropriate transport systems are established to allow retrieval of patients when required. These systems need to be tailored to support hospitals without ICUs or HDUs, and be responsive to direct the patient to the most appropriate hospital where an ICU bed is available within clinically appropriate time-frames.

Support Services

ICUs rely on essential support services that may be externally funded. In particular, physiotherapy, pharmacy and other allied health services are important contributors to patient care in the ICU, contributing to better patient outcomes and shorter ICU and hospital LOS.

Recommendation 8

That where support services (e.g. anaesthetics, pathology, pharmacy and radiology) are not provided at the role delineation level required to support the provision of ICU services under the TCSP, a commitment must be made to invest in support services over the course of the budget forward estimates to ensure they are provided at the appropriate role delineation level.

Pathology: All hospitals conform to the appropriate TRDF level for pathology other than the LGH which at the moment does not provide 24 hour staffing for laboratory tests. Given current activity and level of the LGH ICU, this should be addressed.

Physiotherapy: As has been noted, physiotherapy services across the THOs have been rationed and this delays mobility, discharge and increase LOS. A higher ratio of physiotherapy staffing is required for HDU beds. For a mixed unit 1.0FTE senior physiotherapist per 6 beds is recognised as safe and best practice.

Pharmacy: A major gap in the delivery of clinical pharmacy services is the lack of a full time drug information service. The drug information service only runs during normal business hours from Monday to Wednesday, half a day on Thursday, with no services on Friday. With the move to a single THS it seems timely to provide an extended drug information service to hospitals across the state.

Recommendation 9

That a statewide drug information service is developed and operated at a minimum of 5 days per week.

Funding

Intensive Care is expensive, and the current system relies on local hospitals to determine the number of ICU beds. All ICUs within the state are relatively underfunded, and the total staffed bed stock is below the national average. As a result, budget deficits occur due to ICUs attempting to manage the required caseload.

The Independent Health Pricing Authority currently only funds ICU activity within the LGH and RHH. This funding is designed to minimise the cost associated with ICU activity for DRGs which do not include a component of funding for ICU. This funding is not seen directly by the hospitals, as an adjusted payment is made via DHHS at a rate of approximately \$3.3 million per annum for each ventilated bed. How this occurs is not understood and has led to hospital administrators pressuring a decrease in ICU activity at the local hospital.

Recommendation 10

That funding transparency is improved between the DHHS and THS through the provision of relevant data. This data should be used by the CAG and hospital administrators to ensure that practices are efficient, and that caseload is managed appropriately.

Recommendation 11

That the THS determine systems to ensure that appropriate cost shifting occurs to accurately reflect the cost of care incurred by the receiving hospital for any patient that is transferred.

An estimation of the cost of an ICU bed day at the Royal Hobart Hospital is approximately \$3600 not including pharmacy costs, or an annual cost of \$1.32 million. Wages contribute the majority of costs. Within an ICU patients may change between ICU level care requiring a nursing ratio of 1:1, to HDU level care requiring a nursing ratio of 1:2. This effectively halves the cost of a HDU patient to around \$1800 per day.

In general the costs of ICU are not apportioned back to the unit generating the ICU activity, and as a result decision making regarding the cost benefit of performing a procedure on a high risk patient is not understood by referring clinician. In other words, the cost burden of supporting a high risk patient lies with ICU, not the surgical unit who made the decision to perform the case.

Rapid Response Teams have been mandated by the Commission on safety and Quality in Healthcare. These teams are called to respond to deteriorating patients on the ward, and routinely involve ICU staff. A number of these patients must be moved to beds with a higher level of care ranging from a coronary care area through to an ICU area. Funding for this activity must be included for those units providing the service, and the service should not have a detrimental effect on the care of the patients within ICU as a result of staff being required on the ward rather than in ICU.

Recommendation 12

That consideration is given to costing ICU activity back to the various business units of the THS.

Bed management

Transfer of patients out of the ICU and onto the ward is variable and may frequently occur out of normal hours. There is strong evidence that after-hours discharge is associated with worse clinical outcomes for the patient, and no health redesign program should accept this as the norm.

Systems and processes to support the transfer of patients to a hospital with an appropriate level ICU are not consistent. For example, at the LGH hospital bed coordinators may veto transfer based on hospital activity, whereas acceptance of transfer to the RHH ICU is controlled by the intensivist on-call and is based on availability of ICU staff and an awareness of the needs of the patient. In the event of a time critical transfer to the RHH for neurosurgical intervention, these patients are transferred regardless of an available ICU bed, and the patient may be held in theatre recovery until ICU staff are sourced.

Bed coordinators prioritise ICU discharges against hospital bed status, elective surgery admissions and emergency department admissions. Significant bed block is not uncommon and has an impact on elective surgery cancellations and inter-hospital ICU transfer due to no available ICU beds.

Recommendation 13

That statewide agreement is established among hospital bed management systems to prioritise the transfer of ward ready patients out of ICU to prevent bed block of available/funded ICU beds.

Ideally ICU bed referral and acceptance should be internally managed by ICU consultants and nurses based on clinical need and available staffing, and hospital bed managers should assist in finding staff or beds on the ward to enable timely discharge of patients from the ICU.

Recommendation 14

That the number of ICU beds in each hospital be mandated by the THS under advice from the ICU CAG.

At present any hospital could unilaterally decrease ICU beds either permanently or temporarily, and create pressure on the remaining ICU beds within the state. A state-wide system that has access to real-time ICU bed utilisation and availability should be created and should be easily accessible by Ambulance Tasmania. These systems could be modelled on similar systems interstate.

Recommendation 15

That a statewide ICU bed management system be developed to enable patients to be transferred to the most appropriate centre, and should be accessible by Ambulance Tasmania, and the retrieval coordination service.

All hospitals must have an active mass disaster plan which incorporates areas for ICU decanting at times of significant surge in activity. Ideally these plans should be dovetailed statewide, and should include systems for potential interstate transfer.

Recommendation 16

That a statewide disaster plan be developed, in consultation with all relevant CAGs, which includes guidelines for managing surge capacity and ICU bed management.

Education and training

ICUs may assist patient care on the wards outside the Unit through the development of a liaison service that continues to monitor unwell patients who may have been referred to ICU but don't currently require high acuity support, or may have been recently discharged from ICU.

Education of ward based nurses, and junior medical staff is an important component of this role, as well as ensuring that allied health professionals are utilised appropriately, and that patient safety is maximised through the appropriate use of monitoring, equipment, oxygen delivery and medication.

At a minimum, 50% of nursing staff in the ICU should have a post graduate qualification in Critical Care. Previously the RHH used to have one of the highest rates of post-graduate training in Critical Care nursing in Australia; however, this figure has been falling at the RHH since cuts to nurse education and training were implemented in recent years.

It is evident that the nursing workforce is becoming less experienced year by year, presenting a potential safety issue. Moreover, sudden influxes of new graduates without any increase in capacity of ICU Nurse Educators initially creates more risk and workforce issues as these staff do not have the experience to manage complex cases without proper mentoring and support. Very high numbers of near retirement nursing staff currently support the ability to deliver high standard intensive care, and the sudden exodus of these senior staff is a real risk to the ability to maintain existing levels of service.

ICU assists UTAS with Post Graduate Critical Care Nursing historically training of 8 or more nurses per year. At the RHH this course has been augmented by nurses who have undertaken an introduction to ICU course. Previously around 11 nurses have undertaken this course, but this number has been markedly decreased to 3 graduate nurses this year as a result of budget measures.

Recommendation 17

That the THS support adequate numbers of nurses undertaking critical care training in order to ensure sustainability of the critical care nursing workforce.

Maintaining involvement in ICU research at both the RHH and LGH is essential for CICM accreditation and for improvements in patient care. Data from this work is vital to improve patient outcomes and service efficiencies. Indeed, data collection is essential for performance and safety and quality, but it can only occur with dedicated staff time.

ICU is involved in College training, ward based doctor training, and Medical Student undergraduate training. Additionally, other Colleges may rely on ICU exposure as part of training requirements, for example anaesthetic trainees who must complete a minimum of three months rotation to ICU.

A statewide rotation of registrars training in intensive care may be advantageous, and should be explored under a single THS.

Recommendation 18

That the THS explore the possibility of a statewide rotation of registrars training in intensive care.

Recommendation 19

Once the distribution of services is known, a business case should be developed (with input from the Intensive Care CAG) to enable a state-wide ICU clinical information system. This would ensure uniformity of practice, and the delivery of safe and efficient care in all ICUs.

Safety and Quality

Adequate non-clinical time for specialists and dedicated data collection staff are necessary at all Units, particularly to manage the collection of mortality and morbidity, safety and quality, and performance data, such as mandatory data collection for the Australian and New Zealand Intensive Care Society's Centre for Outcome and Resource Evaluation (ANZICS CORE).

ICU Liaison Nurses are an important member of the multidisciplinary team within the ICU. The RHH needs extended Liaison Nurse availability 7 days a week, preferably from 7.00am to 11.00pm each day. The service adds significant value and quality by supporting ward staff. ICU Liaison Nurses also collect medical emergency team (MET) data, attend MET calls, support Tracheostomy team services and have other non-clinical responsibilities that support safety and quality standards and goals. A Liaison service needs to be funded at the LGH, with the aim of a seven day per week service.

Recommendation 20

That the option of an extended ICU liaison nurse service be investigated at the RHH and LGH hospitals.

Private Hospitals

Private Hospitals should be encouraged to open and maintain ICU and High Dependency beds. These beds should be utilised by insured or compensable patients.

Private Hospitals should not be supported by public ICUs where the private hospital is undertaking activity which has the potential to require ICU admission, and the hospital does not have an ICU. In these circumstances agreement should be made for the Private Hospital to provide funding for any costs incurred by the

public ICU, regardless of the health fund benefits cover.

ICU at RHH is the largest single clinical craft group contributor to the Private Practice Scheme (i.e. other than pathology or radiology), however due to inadequate remuneration from the Health Funds for the bed day, significant savings would occur if these patients were treated in the Private Sector.

Based on the final role delineation framework and Clinical Services Plan, partnerships with the private sector should be explored to potentially develop units of excellence that could include publically funded patients at a discounted cost.

Recommendation 21

That in circumstances where a private patient requires ICU or HDU, this service should be managed and provided within the private sector. The THS must make a concerted effort to negotiate a higher ICU bed day fee for private patients occupying a public ICU bed, as the private funding is significantly lower than required.

Recommendation 22

That following the determination of the final role delineation framework and Clinical Services Plan, partnerships with the private sector is explored to potentially develop units of excellence that could include publically funded patients at a discounted cost.

In Launceston there is a potential role for a small surgical HDU/ICU in the private system, however, a critical mass of local intensivists and nursing staff with exposure to both the public and private systems is needed for this to be sustainable. This would facilitate a significant increase in the capacity of the private hospital to perform more complex cases and keep patients out of public beds. There is surgical support for this model.

In Hobart Calvary Healthcare has an ICU at the Lenah Valley Campus which allows high acuity surgery, support of a Private Emergency Department, and significant neurosurgical throughput. Recently the beds have come under pressure due to nursing staff attrition.

Recommendation 23

That systems be explored to ensure that nurses working in private ICUs can have access to educational resources and potentially secondment to the public ICU in order to maintain skills.

The Hobart Private Hospital has a combined Coronary Care Unit and HDU. Patients may be transferred to this HDU area from ICU as a step-down to ward-based care at the Private Hospital. Discussions regarding a model of cardiothoracic surgery that utilises the private sector are currently underway.

Intensive Care Unit and High Dependency Unit – Service Profile

The CAG has reviewed the service profile for Intensive Care Units and High Dependency Units presented in the draft TRDF.

The CAG is broadly supportive of the proposed service profile but has suggested a number of improvements included in Attachment A.

Recommendation 24

That the proposed changes to the Intensive Care Units and High Dependency Units (Attachment A) be accepted.

Service protocols, policies, planning guidelines, and reports

The CAG recommends that the following service protocols, policies, planning guidelines and reports be considered and understood when planning the scope and distribution of intensive care and high dependency services:

- The College of Intensive Care Medicine of Australia and New Zealand:
 - Minimum Standards for Intensive Care Units (2011)
 - Guidelines on Intensive Care Specialist Practice in Hospitals Accredited for Training in Intensive Care Medicine (2013)
 - Minimum Standards for Intensive Care Units Seeking Accreditation for Training Intensive Care Medicine (2013)
 - Guidelines on Standards for High Dependency Units for Training in Intensive Care Medicine (2013)
 - Guidelines on the use of telemedicine in the Intensive Care Unit (2013)
- The Intensive Care Society Standards Committee:
 - Allied Health Professionals (AHP) and Healthcare Scientists (HCS): Critical Care Staffing Guidance (2003)
- Journal of Critical Care
 - Hodgson CL, Berney S, Harrold M, Saxena M, and Bellomo R, 'Clinical review: Early patient mobilization in the ICU', Volume 28(17) (February 2013)
- The Workforce Advisory Panel Australian College of Critical Care Nurses Ltd
 - ACCCN ICU Staffing Position Statement on Intensive Care Nursing Staffing (January 2003)
- Physiotherapy Department, Freemantle Hospital and Health Service

- Benchmarking Cardiorespiratory Physiotherapy Staff Allocation in Australia Tertiary Hospital
- SHPA Committee of Specialty Practice in Critical Care
 - SHPA Standards of Practice for Critical Care Pharmacy Practice

Australian and New Zealand Intensive Care Society: Centre for Outcomes and Resource Evaluation, *Intensive Care Resources and Activity Report 2010-11*, (Carlton: ANZICS CORE, 2013).

Australian Commission on Safety and Quality in Healthcare, *Standard 9: Recognising and Responding to Clinical Deterioration in Acute Health Care* (2012). Available online: http://www.safetyandquality.gov.au/wp-content/uploads/2012/10/Standard9_Oct_2012_WEB.pdf

Tasmanian Government, *Delivering Safe and Sustainable Clinical Services – Green Paper* (2014). Available online: http://www.dhhs.tas.gov.au/data/assets/pdf_file/0006/179052/141208_vF_OHS_GreenPaper.pdf.

References

Attachment A

The Intensive Care CAG has reviewed the service profile for Intensive Care Units and High Dependency Units presented in the draft TRDF.

The CAG is broadly supportive of the proposed service profile but has suggested a number of improvements included in this attachment.

Adult Intensive Care & High Dependency

An Intensive Care Unit (ICU) is a specially staffed and equipped, separate, self-contained section of a hospital for the management of patients with potentially life threatening conditions, and/or potentially reversible organ failures. An ICU provides clinical expertise, facilities and equipment for the support of patients and their families, utilising skills of specialist medical, nursing and allied health staff who are specifically trained in the multidisciplinary management of critically ill patients.

A High Dependency Unit (HDU) may be combined with an ICU or located separately. Standalone High Dependency Units may be used for patients requiring closer observation, treatment and nursing care than can be provided on a general hospital ward.

ICU's / HDU's provide high level acute, clinical support for the various specialist and subspecialist medical and surgical services operating within a health service or hospital. In this sense, ICU provides a safety net for those patients undergoing major surgery, procedures and treatments, and for managing complications of these. ICU also supports those patients who present to the Emergency Department with severe acute reversible illness or injury, ICU care may also include end of life care and support for potential organ donation. Additionally, Intensive Care medical and nursing staff provide a wide variety of outreach services to support patients on acute hospital medical and surgical wards.

This Framework describes the structure of these multidisciplinary services, their minimum system requirements, their staffing needs and the other clinical support services each of which is necessary to run safe and sustainable Intensive Care services within each designated hospital level in Tasmania.

There are No Level 1, 2 or 3 Intensive care services described.

Tasmanian hospitals functioning at these levels do not require on-site ICU or HDU services. These levels of hospital or clinical service need systems for urgent care and rapid transfer to larger regional centres, where high quality Specialist Intensive Care services are safe and sustainable.

Level 4 Intensive Care Unit / High Dependency Unit

Service description

A Level 4 service provides a self-contained critical care area with easy access to the emergency department and operating theatres.

A Level 4 service has the capability of providing immediate resuscitation and short-term cardiorespiratory support for critically ill patients. It must be capable of providing mechanical ventilation and simple invasive cardiovascular monitoring for a period of at least several hours.

Service requirements

- Separate and self-contained facility in the hospital capable of providing basic, multisystem life support, usually for up to 36 hours
- Provides mechanical ventilation and simple invasive cardiovascular monitoring
- Admission and discharge protocols for all beds to be determined by the Medical Director.
- Established referral relationship with a Level 5 or Level 6 ICU including defined transfer policies and access to telemedicine support
- Formal audit and review of activities and outcomes through participation in the Australian and New Zealand Intensive Care Society Centre for Outcome and Resource Evaluation database activities
- 24 hour access to on-call pharmacy, pathology, operating theatres and imaging services.
- All patients admitted to a Level 4 Unit must be referred to the Consultant Specialist taking responsibility for the Unit at the time of admission (with the exception of Coronary Care Patients)
- Active hospital based infection control unit and policies

Workforce requirements

- Medical Director with a full-time commitment to the operation of the ICU and who is a Fellow of the College of Intensive Care Medicine (CICM)
- Sufficient registered specialists from relevant disciplines on-call 24 hours, with rostering and call arrangements determined by the Medical Director.
- In addition to the attending Specialist, at least one on-site registered medical practitioner with appropriate level of experience, airway and ALS skills, rostered for the ICU and immediately available at all times to attend the ICU
- A nurse in charge of the ICU who has a post registration qualification in intensive care
- All nursing staff in the ICU responsible for direct patient care being registered nurses with the majority of all nurses having a post registration qualification in intensive care.
- All nurses working in ICU must have ECG interpretation, ventilation, invasive line management, and ALS competence at a minimum.

- A minimum of two registered nurses present in the unit at all times when there is a patient present in the unit, and this number should be maintained irrespective of Rapid Response Team involvement.
- Educational programs for both medical and nursing staff which may include links with level 5 or 6 referral centres and tertiary education institutions
- Access to a dedicated ICU nursing educator.
- An orientation program for new staff.
- A minimum nurse–patient ratio of 1:1 for ventilated and similarly critically ill patients, as determined by senior medical and nursing staff
- A minimum 1:2 nursing ratio for high dependency patients
- Access to technical support staff (e.g. biomedical engineers and scientific officers), as required
- Appropriate access to clinical pharmacist, physiotherapist, social worker, dietician, pastoral care and any other allied health services.

• Support service requirements

Anae	Path	Phar	Rad
4	4	4	4

Level 5 Intensive Care Unit / High Dependency Unit

Service description

A Level 5 ICU provides services at Level 4 plus it has the capability of providing a high standard of general intensive care including more complex, extended, multisystem life support.

A Level 5 service provides mechanical ventilation, renal replacement therapy, invasive cardiovascular monitoring for extended periods. A level 5 ICU with suitably trained clinical and support staff and resources, may be capable of providing more advanced respiratory and cardiovascular support using ECMO. , However this is not essential to the minimum provisions for a level 5 ICU service.

Service requirements

As for Level 4 plus:

- Accredited CICM training program
- Regional referral role.
- Adequate capacity, equipment resources, and medical and nurse staffing to support the required elective caseload, emergency surgical referrals and any medical procedural services provided on-site, locally or in affiliated regional centres. This will ultimately depend on the nature and level of other services delivered in the region and should be addressed and adjusted in line with other service structures.

- Access to urgent echocardiography services 24/7, by either trained Intensive Care Specialists, Cardiologists or Cardiac sonographers.
- Specialised bariatric lifting equipment integrated into bed spaces
- Nearby inpatient rehabilitation services for post-critical illness recovery and support
- Adequate staffing and resources to provide any ward-based support service or outreach programs and deteriorating patient quality assurance. (ACSQH Standard 9.)
- Active research program including research nurse and data collection
- Adequate clerical and administrative support, as per CICM guidelines
- Systems for the facilitation and support of organ donation

Workforce requirements

As for Level 4 plus:

- Minimum 50% of all nursing staff to have post registration qualification in ICU
- Capacity to provide greater than 1:1 care if required
- Each nursing shift requires a designated Clinical Nursing Co-ordinator and ACCESS nurses. The number of ACCESS nurses required per shift will vary depending on percentage of qualified staff. E.g. Units with 50-75% qualified ICU nurses require one ACCESS nurse for every 6 patient's. (ACCCN ICU staffing position statement, 2003).
- Capacity and staffing models adequate to cope with surges in demand for unexpected peaks in emergency referrals, both from within the institution and from referring regional centres
- Allied health support, including dedicated, specialised ICU physiotherapists. Recommend 1.0 FTE Senior Physiotherapist per 7 ICU beds OR 1.0 FTE Senior per 5 HDU beds
- A dedicated ICU Clinical Pharmacist. Other pharmacy services including compounding, sterile room services, TDM, clinical drug guidelines and protocols.
- Equipment officer
- Specialist nursing positions including Clinical Nurse Educator (1 FTE per 50 nurses, Clinical Nurse Consultants or Clinical Nurse Specialists, ICU Liaison Nurse, ICU Research and Quality Nurse Coordinator and ICU Equipment Nurse.

Support service requirements

Path	Phar	Rad
5	5	5

Level 6 Intensive Care Unit / High Dependency Unit

Service description

A Level 6 service provides services at Level 5 plus it is the highest level referral unit for intensive care patients and is capable of providing comprehensive critical care, including complex and multisystem life support for an indefinite period, and support for complex Level 6 activity. A Level 6 ICU should contain and be supported by services that provide patient care at a level which delivers appropriate clinical services for all types of illness/injury, other than those which the State does not support such as acute transplantation medicine. As such a Level 6 ICU should not require transfer of acute patients to other ICUs except for times of significant bed pressure. However, elective transfer of patients to other ICUs within the State should be supported where services exist to support the patient, and the transfer facilitates better proximity to the patient's family.

Service requirements

As for Level 5 plus:

- Sub-specialty Cardiothoracic and/or Neurosurgical throughput and support
- Appropriate systems for support of Tertiary Trauma and/or Major Burns centre. patients
- Hyperbaric chamber available at short notice
- Participates in the trauma team for the hospital
- Formal research program
- Has statewide and interstate referral role.
- Capacity for extended advanced respiratory and cardiovascular support using ECMO.

Workforce requirements

As for Level 5 plus:

- Fellow of CICM qualified ICU Consultant specialists on-call 24 hours
- ICU registrar on-site and exclusively rostered to the Unit 24 hours.

Support service requirements

Path	Phar	Rad
6	6	6

Separate HDU

Stand-alone HDU, not co-located within a level 4, 5 or 6 ICU

Service description

An HDU is a specifically staffed and equipped section of a hospital that provides a level of care intermediate between intensive care and general ward care. It may be located in a hospital with Level 4, 5 or 6 ICU's or as a satellite unit supported by ICU in another hospital within a reasonable transport time, as long as transfer systems are available, safe and robust.

Patients may be admitted to the HDU:

- a) from the ICU as a step-down prior to transfer to the ward, or
- b) directly from the ward, post-anaesthetic care unit (recovery) or emergency department, or from nearby lower level health facilities, such as day surgical centres, or small rural hospitals (level 1-3).

Typical patients in HDU have single organ system dysfunction or failure and/or are assessed to be at a high risk of developing acute complications. An HDU should have sufficient resources and immediate access to appropriately skilled medical staffing for the immediate resuscitation and management of critically ill patients. Equipment should be available to manage short term life-threatening emergencies, e.g. the need for mechanical ventilation.

In stable patients, routine monitoring and support may include ECG, oximetry, and short term invasive measurement of blood pressure with pre-defined acceptable parameters that trigger escalation pathways.

The use of low level inotropic or vasopressor support, and non-invasive ventilation may only occur after consultation with a Consultant Intensivist from an operationally linked ICU.

Service requirements

- All patients admitted to the HDU are referred to an attending Intensive Care Specialist for input towards management.
- Defined admission, discharge, management and referral policies.
- Operationally linked to an ICU which should be closest by distance and transport time.
- At all times, an ability to have either Anaesthetic, Emergency Medicine, or Intensive Care Specialist attendance within 15 minutes to assist with acute medical emergencies.
- An ability at all times to access theatre recovery or the Department of Emergency Medicine for short term ventilation and stabilisation whilst awaiting retrieval services to attend.
- Formal audit and review of activities and outcomes through participation in the Australian and New Zealand Intensive Care Society Centre for Outcome and Resource Evaluation database activities.
- 24 hour access to on-call pharmacy, pathology, operating theatres and imaging services.
- Appropriate access to physiotherapy and other allied health services.
- Structure and Equipment needs should adhere to CICM IC-13 recommendations.

- Equipment Officer support from the affiliated ICU.
- Equipment policy and unit guidelines that maximise compatibility and familiarity with the affiliated ICU.

Workforce requirements

- A medical director who is a Fellow of the College of Intensive Care Medicine (FCICM).
- Senior medical coverage of patients within HDU is dependent on the type of HDU. The HDU must have defined protocols to determine which Specialist is to be called for an individual patient, and this protocol must be determined by the medical director.
- All patients admitted to HDU must be referred to the on-call Intensive Care Specialist from the linked ICU in order to ensure patient safety and appropriateness of admission.
- Any patient remaining in the HDU for greater than 36 hours as a result of illness severity must be reviewed by an Intensive Care specialist.
- In addition to the attending specialists, at least one registered medical practitioner with appropriate ALS and airway experience must be available within 15 minutes at all times.
- A nurse in charge of the HDU who has a post registration qualification in intensive care
- All nursing staff in the HDU responsible for direct patient care being registered nurses and the majority of senior nurses having a post registration qualification in intensive care or high dependency nursing.
- All nurses working in HDU must have ECG interpretation, and ALS competence.
- A nurse to patient ratio of 1:2.25 or 1:3 (26 hours) (NHpPD HDU model (standalone))
- A minimum of two registered nurses present in the unit at all times when there is a patient present in the unit, and this minimum should not be affected by HDU staff involvement in Rapid Response Team call-outs.
- Educational programs for both medical and nursing staff, and access to a nursing educator.
- An orientation program for new staff.
- Access to technical support staff (e.g. biomedical engineers and scientific officers), as required
- Appropriate access to allied health generally including rostered daily physiotherapy and availability of clinical pharmacist, social workers, dieticians, pastoral care and other allied health services.
- Education program for nursing and medical staff which may include links with level 5 or 6 referral centres and tertiary education institutions

Support service requirements

Anae	Path	Phar	Rad
3	3	4	4

Paediatric ICU patients & Adult ICU's

Paediatric Intensive care is not included within the scope of this document, however in general the principles remain the same. Paediatric in-patient services must be supported by an appropriate level of Paediatric ICU care. At present there is a single Paediatric ICU in Tasmania which is part of the Neonatal and Paediatric ICU (NPICU) based in Hobart. Approximately 150 Paediatric Intensive Care patients are admitted per year out of a total of around 600 patients including neonates.

On occasions selected paediatric patients with single organ system problems may spend short periods of time in an Adult Intensive Care Unit, prior to transportation to a Specialist Paediatric ICU or until clinical improvement such that ICU level care is no longer needed. This should only occur following consultation with an on-call Paediatric Intensivist.

All patients in Tasmania who are under 15 years of age and needing Intensive Care or High Dependency Care support should be managed in consultation with the NPICU Consultant on call at Royal Hobart Hospital, regardless of the patient's location. The decision to transfer a patient to the NPICU lies with the Paediatric Intensivist.

Transfer of paediatric ICU patients around or out of the state is undertaken by the PETS service based in the NPICU, Hobart or by the adult retrieval service (AMMRD). All such patients should be discussed jointly by the NPETS and adult retrieval coordinating consultants on call. Ambulance Tasmania Flight Paramedics will accompany the patients alongside a doctor from the PETS service or AMMRD and/or a nurse from the NPETS service.