

REGISTRAR ORIENTATION MANUAL 2022



Intensive Care
Services

Te Whatu Ora
Health New Zealand
Capital, Coast and Hutt Valley

Wellington Regional Hospital
wellingtonicu.com
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INDEX

1.0 Introduction

2.0 Registrar Administration

- 2.1 General Administration
- 2.2 Daily Timetable
- 2.3 Timesheet Tips
- 2.4 Renumeration in Intensive Care Services

3.0 Information for Medical Staff

- 3.1 Accountability
 - 3.1.1 Referrals Communication & When To Call The Boss
- 3.2 Medical Cover
- 3.3 Audit & Education
- 3.4 Leave
- 3.5 Registrar Duties
- 3.6 Ward Activities
- 3.7 Patient At Risk (PAR) Service
- 3.8 Tracheostomy Review And Management Service (TRAMS)
- 3.9 Handwashing

4.0 Training And Assessment

5.0 Admissions, Discharges & Transfers

- 5.1 Admissions
 - 5.1.1 Elective or Booked Admissions
 - 5.1.2 Acute Admissions
- 5.2 Discharges & Transfers

6.0 Documentation

- 6.1 General Information
- 6.2 Death

7.0 Procedures in ICU

- 7.1 Central Venous Lines
- 7.2 Arterial Lines
- 7.3 Pulmonary Artery Catheters
- 7.4 Intercostal Drains
- 7.5 Urinary Catheters
- 7.6 Endotracheal Tubes
- 7.7 Gastric Tubes
- 7.8 Naso-Jejunal Tubes
- 7.9 Echocardiography

8.0 Orientation Lectures

- 8.1 Emergencies

9.0 Medical Policies

- 9.1 Blood Testing in Intensive Care Patients
- 9.2 Medications & the ICU Drug Manual
- 9.3 Orientation to the Flight Retrieval Service
- 9.4 Advanced Analgesia

APPENDICES

- 1 Communicating with Families
- 2 Timesheet Tips
- 3 Procedures for Coroner's Cases
- 4 Principles for Antibiotic Prescription
- 5 Cardiac Surgical Management
 - 5B Haemodynamic Protocol
 - 5C Protocol for Bleeding Post-Cardiac Surgery
- 6 Severe Head Injuries
- 7 Neurosurgical Management of Subarachnoid Haemorrhage
- 8 Early Management of Trauma

- 9 ICU Medical Staff Daily Allocation
- 10 End of Life Care in the ICU: a reference guide for registrars



1.0 INTRODUCTION

Welcome to the Intensive Care Service at Wellington Regional Hospital. We hope that you will find your rotation with us both interesting and challenging. We also hope that you will gain knowledge and experience in caring for critically ill patients that you can use in your future career.

Orientation lectures are held for the first 3 days of the run. Apart from the orientation to the aeromedical retrieval service ([at the Life Flight Base at Wellington Airport](#)), they take place in the **Seminar Room, ICU, Level 3, Wellington Regional Hospital**. The orientation lectures will take priority over all other activities. All new registrars must attend including those rostered to clinical or after hours duties. The ICU specialists will cover clinical duties during this time. The orientation lectures give you some basic understanding of what we do and how we do it, but will by no means be a comprehensive explanation of everything. Most of what you will learn will occur during the ward rounds and day-to-day clinical activities.



It is important to utilise the resources around you. The senior nursing staff and unit technicians have a wealth of experience and knowledge that you may find helpful. Comprehensive information about our unit can be found on the ICU website at wellingtonicu.com. The most recent [Orientation Schedule](#), [Teaching Timetable](#) and [Journal Club](#) roster are all linked to here and also available online under the '[Education](#)' section, along with many other resources. Unit and hospital policies can be found on the CCDHB Intranet, accessed through your hospital login.

2.0 REGISTRAR ADMINISTRATION

2.1 General Administration

Leave forms and expense claim forms can be obtained from, and returned for action to the Administrative Coordinator.

2.2 Daily Timetable (Weekdays Only) - SEE APPENDIX 9 ALSO

8am	Medical Handover (ICU Seminar Room)
9am	Night Registrars finish
9-10.30am	Morning Ward Round (North, Central & South)
10.30am	Radiology Meeting (in Radiology department, Level 2)
11am	Clinical Duties
4-5pm	Afternoon Ward Round (North, Central & South)
9-10pm	Evening Ward Round (Long day registrars handover to night registrars)
11pm	North End Night Registrar attends Hospital At Night Handover (MAPU Seminar Room)



The 24 bed unit is geographically divided into three pods:

- **Central** pod (Bed nos. 1-7, 17-18 - 9 beds)
- **North** pod (Bed nos. 8-16 - 9 beds)
- **South** pod (Bed nos. 19-24 - 6 beds)

Each pod is managed by a specialist and RMO. The Long Day registrars go to North & South pods; Short Day to Central Pod. Flight Day to whichever other pod is busiest.

There is a specialist handover at the 4pm Ward Round. The central pod specialist assumes clinical responsibility for every patient in the unit until the following morning. *The long day registrars must maintain continuity in the unit at all times.* This means being up to date with all the patients in their respective pod (not just some). It is appropriate for the long day registrar to delegate duties and responsibility to the short day registrar, as they see fit. Activities outside of the unit - medical emergency team (MET) calls, trauma calls, ED or ward referrals - go to the short day or evening registrar in the first instance. These registrars therefore carry the emergency phone.

Appendix 9 contains a more detailed timetable of both weekday & weekend medical staff allocations.

2.3 Timesheet Tips

A record of hours worked is submitted electronically using Payroll Kiosk (available on your hospital desktop) on a weekly basis. Your shifts will generally be pre-populated in the Payroll Kiosk system by the ICU administration coordinator in advance, however if this hasn't been done please enter them yourself. Accuracy in submitting your Payroll Kiosk data is paramount to ensure that ICU registrars continue to receive pay appropriate to the roster intensity.

2.4 Remuneration in Intensive Care Services

Registrars in Intensive Care are employed on a salary, according to the Resident Doctors Association Collective Employment Agreement (RDA MECA).

The salary band is defined by an hourly range based on the average hours worked during the run. The present run is calculated and defined in the Run Description which you will find at the end of this manual.

The hours averaged over a complete run are about 44 per week (**Category F**). However, as the ICU registrar job operates as a full rostered shift system, the RDA MECA states that the job be paid at a **category C** rate (equivalent to 55-60 hours per week) regardless of the number of hours that you work. This is why there is a disparity between the number of hours you actually work (44 on average) & the number of hours that you are paid for (55-60) i.e. you are paid for 30% more hours than you actually work (on average) to compensate for the inconvenience of shift work.

More information about the RDA MECA can be found on their website here: <http://www.nzrda.org.nz/meca/>

Overtime:

On occasions you will work past the end of your shift and this is termed 'unrostered overtime'. Within the contract, this is not paid additionally, as it is included in the salary you receive for that bracket of hours. *However, if you feel that the overtime hours worked would make the averaged hours per week higher than the bracket you are in, then you are able to ask for a 'run review' to be carried out.* This examines the average number of hours worked over the previous six weeks and is a mechanism to ensure that you are not working large amounts of unpaid overtime.

On-Call:

Ensure the hours you are on-call is recorded on Payroll Kiosk, excluding any call-back. This will be paid at \$4 per hour. This is the paid rate for flight on-call from home in addition to your basic salary.

Callback:

This occurs when you are on-call, have finished your shift, have left the department, and are then required to return to work - this is almost always only applicable for flight on-calls. This is paid at a **4 hour minimum** with additional hours paid at the actual number of hours you work (i.e. if you work 2 hours callback, you are still paid for 4 hours work; if you work 5 hours callback, you are paid for 5). This is paid at call-back rates which are detailed in the RDA MECA. The clinical leader will review all call-backs that occur within 10-20 minutes after leaving work to ensure they are justified.

Orientation:

During the first 2½ days of the run we require you to attend the orientation sessions. Due to the mutual benefit gained from your orientation and use of your time to do so, we will pay registrars at the normal rate for the hours they attend if not already rostered to work those days. These should be claimed on Payroll Kiosk as 'Orientation'.

Teaching:

We provide a comprehensive registrar education programme. Registrars who are rostered on duty at the time of the session will be released to attend, however this does need to take into account urgent clinical work which does take priority. The teaching programme is incorporated into your run category calculation as paid hours, so registrars who are not rostered on clinical duty at the time of the session should still attend. It is very important that you fill in your Payroll Kiosk accurately, so that we can be clear about the hours you are working.

3.0 INFORMATION FOR MEDICAL STAFF

3.1 Accountability

Intensive Care is a specialist led service. Medical care is directed by specialists, but medical responsibilities are delegated to registrars according to their knowledge, abilities, experience and progress. Registrars remain at all times accountable to the on-call specialist for the day (the central pod specialist). **You are not expected to know everything, but are expected to ask.** Patient treatment should only be changed within the agreed parameters which have been discussed with the on-call specialist. Wellington Intensive Care is a 'closed' unit in so far as medical treatment is primarily directed by the Intensive Care team, with input from other specialities as appropriate. Patients can only be admitted to our ICU with Intensive Care Specialist (or delegated SR) approval.



3.1.1 Referrals, Communication & When To Call the Boss

General communication rules:

Be respectful and polite at all times; expect the same from your colleagues.

Communication with other units:

If a cardiac surgical patient is bleeding excessively call the cardiothoracic surgical consultant directly (**not** the registrar); notify the registrar subsequently as a courtesy if you have time. The cardiac surgeons **always** want to know if their patients are bleeding excessively. The ICU specialist should already have been informed.

Neurosurgery, cardiothoracics, paediatrics, general surgery and haematology services in particular appreciate being closely involved in the day to day management of their shared patients in the Intensive Care Unit. Any management disagreements should be resolved by communication at a specialist level.

Any requests to external teams who not already involved in the patient's care for review of an ICU patient must be made in consultation with the responsible ICU specialist.

Golden rules for referrals:

- Nullius in verba (trust no-one) but never make anyone feel bad for asking for help
- Review everyone in person if you can
- Tell the ICU specialist/SR about **every** referral you receive even if it is 4:30am

When to call the specialist:

You **MUST** notify the ICU specialist or SR as soon as feasible about every admission, every referral and every discharge. Also:

- **No patient can be refused admission except by a specialist (or SR)**
- **If you are faced with a procedure that you are not completely comfortable with and help is not readily available**
- **If a specialist or specialist registrar from another unit requests you to do something contrary to the ICU plan**
- **For every retrieval, once you have assessed the patient at the referring hospital**
- **If a patient requires intubation (even if you are able to perform that procedure yourself)**
- **If oxygenation or ventilation unexpectedly worsens; in particular if the FiO₂ is >60% or the pH is less than 7.2**
- **If a patient unexpectedly develops a new inotrope or vasopressor requirement**
- **If the noradrenaline requirement exceeds 10ml/hr (1mg/hr)**

3.2 Medical Cover

Rostered medical cover is provided at specialist and registrar level 24 hours a day, seven days a week. Registrars work shifts according to a regular cycle. Any proposed changes to the published weekly roster must be discussed with the Admin Coordinator and approved by the Clinical Leader. It is important that registrars are available within the unit for immediate patient problems or phone calls. If you need to leave the unit at any time, then you should inform the Associate Charge Nurse Manager (ACNM) where you are going. You should not leave the hospital except on approved patient transfers unless discussed with the duty consultant.

3.3 Audit and Education Sessions

Departmental meetings and audit are held on Friday afternoons between 1pm and 3pm, after the Journal Club (see below). These meetings are used to review all patients currently in the unit in preparation for the weekend, discuss the patient care we have provided, and to review patients who have died or required readmission to ICU. All registrars are encouraged to attend the departmental meetings. Journal Club is held from 1pm Friday in the Seminar Room. Recent ICU articles are presented and discussed.

Registrar education sessions will be held every Thursday from 12pm in the ICU Seminar Room. There is also in-situ sim sessions approximately every fortnight following the teaching. The topics to be covered are available on the notice-board outside the SMO's office and available on the ICU website. Links to both the teaching and Journal Club timetable are provided in the Introduction above.

It is understood that non-Intensive Care trainees may have other teaching requirements within their area of specialty. The sessions in our unit are made available for you to gain knowledge in the area of intensive care and so it is requested that you attend. Attendance at teaching sessions run by other departments is supported, but is dependent upon the workload in the unit.

3.4 Leave

There are three registrars available on the roster to provide cover for leave. It is preferable that leave not be taken over night shifts. Preference is given to cover exams, exam courses and then on a 'first come first served' basis. Generally, senior registrars will cover senior registrar leave and registrars will cover registrar leave; however, on occasion a senior will need to cover a junior or vice versa. All leave entitlements (annual, sick, parental, study etc.) are as described in the RDA MECA.

3.5 Registrar Duties

The **long day** registrars are primarily responsible for the coordination of the care of all the patients within the unit. They must attend and complete the morning ward round and preferably should remain in the unit during the day. The short day and evening registrars should be used to attend to patients outside of the unit. The long day registrar is expected to be up to date with the condition of all the patients under their care, and be able to discuss these with the on-call specialist/senior registrar, and to present the case at handover rounds.

The **short day** registrar is responsible for patients in the central pod. This responsibility is handed over to the evening shift registrar at 4pm.

The **evening shift** registrar works from 2pm-10pm. They handle responsibility for the central pod from 5pm. After the short day registrars go home at 5pm, they will take the MET phone. Flight retrievals in the late afternoon/early evening which may disrupt the shift times for the flight registrars may be handled by the evening shift registrar. If this is the case, then the flight day registrar will take over the south pod until 7pm, at which time the flight night registrar will take over until the evening registrar is back (or until 10pm).

The **flight day** registrar rostered to flight retrievals from 7am until 7pm. If not required to provide flight cover they work on the floor as an additional 'short day' registrar from 8am-5pm, primarily responsible for attending MET calls, Trauma Calls and reviewing inpatient referrals - however they must remain available for urgent flight duties (in which case hand the call phone to short day reg)

The **flight night** registrar is available on call at home from 7pm until 7am. Occasionally they may be required to come in and assist on the unit if it is busy, or if another registrar is absent due to sickness or an overlapping flight.

On the weekends, the **flight day** registrar is on call for flights 7am-7pm, for 9 hours of which they are physically present in the ICU from 8am to 5pm. The **flight night** registrar covers 7pm-7am on call from home and does not have to attend unless requested. Occasionally it may be necessary for the duty specialist to send a registrar off the floor on a flight (e.g a time-critical emergency retrieval, or a complex case that requires an experienced senior registrar) - in this case the flight call registrar may be asked to come in to help cover the unit, and can claim call back for this time.

The workload and hours of work are often unpredictable. If you are required to stay past the usual finish time, you should **not return to work without an eight hour break** without the express permission of the on-call ICU specialist. Please discuss with them if you have concerns over your levels of fatigue or ability to perform to the level required, at all times.

The **senior registrar** who is rostered on to the senior registrar shift will take responsibility for running of the unit under the supervision of the specialist. The senior registrar role is designed as a transition role between registrar and specialist; however, the responsibility for patients in the ICU ultimately rests with the ICU specialist on-call. The senior registrar on this shift is expected to work 'on the floor' from 8am until 5pm but may, at their own discretion, go home between 5 and 9pm. They will then attend the evening ward round at 9pm and will be available as the first port of call for ICU registrars overnight. If the senior registrar needs to return to the hospital overnight, they will be paid call back in accordance with the RDA MECA. Call-back is **not** paid between 5 and 9pm as they are actually rostered on during this time (but allowed to be on-call from home).

3.6 Ward Activities

The main formal medical staff activities on a weekday are laid out in section 2.2 above. There are three ward rounds every weekday, and two every day at the weekend.

For weekdays in more detail:

8am Morning handover in seminar room with presentation of all patients by the night registrars. All MET calls & overnight referrals are also presented along with the anticipated (elective) workload of the day & any imminent retrievals.

8.30am Consultant ward rounds with a complete review of every patient's progress and treatment. The long day registrars must remain with the ward round - if there are jobs that urgently need doing these should be delegated to the short day registrar.

10.30am All current radiology and radiology from the previous day are reviewed with a senior radiologist. The long day registrars must attend this meeting to provide brief clinical vignettes of the patients, for continuity of care and their own education.

4pm Handover (to central pod specialist) and review round of all patients including new admissions since morning ward round.

9pm Handover with long day registrars handing over to the night registrars. Includes specialist review of new admissions.

11pm The north base night registrar attends medical handover meeting in the MAPU Seminar Room.



MORNING WARD ROUND

The morning ward round is the most important part of the patient care that we provide. It is important to review all that has happened, the current treatment we are providing and to review the current orders, drug charting, equipment and invasive lines. All issues relative to a patient should be discussed before the ward round leaves each bedspace. It is important that the nurse caring for the patient is present and can actively participate in the discussions.

The method by which the specialists review the patients will vary but it is expected that the review will cover all aspects of the patient's care. These may be summarised under the headings of neurological status, respiratory, cardiovascular and fluids (including inotrope or vasopressor support), renal function, gastrointestinal function and nutrition, infection and antibiotics, miscellaneous other items, instrumentation and vascular access, documentation and drug prescription, communication and family issues. The acronym 'FASTHUG' has been previously proposed and is used here in an adapted form as a reminder of standard ICU cares that may be otherwise overlooked. It stands for Feeding, Analgesia, Sedation, Thromboembolic prophylaxis, Head of bed elevation, gastric Ulcer prophylaxis, & Glycaemic control, and should be done for each patient every day. A plan for the day will be worked out and documented. Every ward round needs to be documented in the patients notes by either the long or short day registrar. It should include a clearly documented plan (replicated on the daily ICU chart) as well as an understanding of the rationale for each action point.



LIMITATIONS ON TREATMENT

Some patients will not survive whatever is done for them, or may survive with a quality of life or at a personal cost which we (and they or their surrogates) consider not to be justified. Our default position on all patients is that they are **for full active treatment unless a decision is made to limit treatment or to withdraw treatment**. Such a decision is usually arrived at as a consensus between the ICU specialists, the patient or their surrogate and the patient's own medical team. **It is inappropriate to half-heartedly provide treatment when a decision to limit treatment has not been made.**

Levels of limitation may include:

- Pre-set limits for which support may not be provided beyond e.g. not for intubation or ventilation
- A limit on inotropes/vasoconstrictors (e.g. a noradrenaline infusion up to a maximum rate)
- Not for haemodialysis or invasive ventilation
- Limitation in extremis, e.g. not for cardiac massage or defibrillation in the event of a cardiac arrest
- Withdrawal of specific therapies after discussion between specialists, the patient's family and usually the admitting team

A form entitled '[Allow a Natural Death in ICU](#)' is available to improve communication and planning regarding the management of patients on whom treatment has been withdrawn and should be used in these situations.

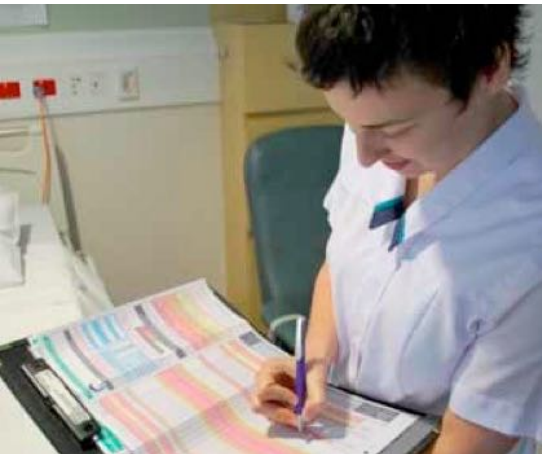
Due to the nature of the patients we care for, death in the ICU is common. The service admits about 1800 patients every year, with an ICU mortality of 9%. This means that on average 3 patients will die in the ICU every week. Unexpected death in ICU is uncommon - most patients die because ongoing treatment is deemed futile and consequently extraordinary measures have been discontinued. Such patients are entitled to and expected to continue to receive therapy aimed at alleviating distress or pain. For some registrars from specialities where death is uncommon, this can be challenging. Please talk to the responsible ICU specialist or one of the ICU Supervisors of Training if you are having difficulties. Your mental health and wellbeing are important too.

3.7 The Patient At Risk (PAR) Service

The Patient At Risk (PAR) Service

(<http://www.wellingtonicu.com/AboutUs/Services/PAR/>)

The PAR team consists of senior nurses with advanced skills in assessing & caring for deteriorating patients in a ward environment. Many of them also work as ICU nurses. They visit the wards to share their expertise where and when they are needed. PAR nurses aim to support and educate ward staff in recognising patients who are deteriorating and in initiating appropriate care.



Their role is to:

- Follow up all critical care patients discharged from the intensive care unit to support their continued recovery on the ward & prevent ICU readmission
- Provide extra support for family/whanau of patients recently discharged from intensive care
- Implement the Early Warning Score (EWS) system and protocol in all in-patient wards of the hospital to assist in identifying and treating deteriorating patients
- Support all ward staff in caring for at-risk patients within the ward environment
- Provide teaching to ward staff to improve their skills when caring for the sickest patients in the ward environment.
- Help to facilitate referral and transfer to a higher level of care in a timely manner when necessary.

PAR and the ICU Registrars:

It is important to understand that the PAR nurses cannot refer patients to ICU directly; all referrals must come from the primary team looking after a patient. The PAR nurse may help to facilitate the referral process and may also have a “just to let you know” conversation with you at the end of their day so that you can be aware of potential clinical deterioration overnight.

PAR nurses often work in relative isolation. This can be challenging and the PAR nursing team will sometimes need support from you. The nurses may ask for some advice about a particular clinical scenario, assistance interpreting an X-ray or may just want to have a bit of a chat about something that is happening out on the wards.

If you review an unwell patient on the ward or in ED who doesn't require ICU admission but may benefit from further follow-up, please discuss the patient with the PAR Team. If they were not already aware of the patient, they can help you in providing a closer eye on anyone you may be worried about.

PAR nurses also respond with you to emergency '777' calls (MET and cardiac arrest calls) 24 hours a day. Their main role is to support the patient and ward staff during the event, but are they are also a very useful resource for medical staff (particularly the ICU registrar) in managing deteriorating patients in sometime challenging environments.

Wellington Hospital uses a vital-sign based escalation protocol to ensure that deteriorating patients receive appropriate escalated therapy and that futile measures that don't result in physiological improvement are not perpetuated. Increasing scores are assigned to 7 different vital sign parameters the further they deviate from the norm. It is therefore possible to obtain a 'maximum' system response of a MET call, of which the PAR nurse & the ICU registrar are two key members. The matrix that shows the 7 vital signs (respiratory rate, oxygen saturation, need for supplemental oxygen administration, temperature, systolic blood pressure, heart rate, and level of consciousness) and their scored values are shown below:

It is possible to trigger a MET call from either a single extreme vital sign deviation, from a combined score of 10 or more, or because the member of staff is sufficiently worried to call one.

Patients who score 6 or more trigger the algorithm for escalated review beginning with junior ward medical staff & the PAR nurse, escalating to a MET call as shown below. As such, the ward team are given the opportunity to manage patient deterioration themselves before ICU involvement is required. Junior medical and nursing staff are mandated to escalate care if either patients continue to deteriorate or they are unable to get the assistance they require.

Part of your orientation program includes a session on the PAR service, Early Warning Scores & the Medical Emergency Team responses system. More information, statistics relating to & details of the escalation pathway can be found in the EWS library here: ews.wellingtonicu.com

Wellington Hospital has been instrumental in developing the Health Quality and Safety Commission's national patient deterioration programme. The national New Zealand Early Warning Score and the national vital signs chart, now implemented in every New Zealand hospital, is based on that developed by Wellington ICU.

SCORE	MET	3	2	1	0	1	2	3	MET
ZONE	BLUE	RED	ORANGE	YELLOW	WHITE	YELLOW	ORANGE	RED	BLUE
Resp Rate	<5	5-8		9-11	12-20		21-24	25-35	>35
SpO ₂		≤91	92-93	94-95	≥96				
Supplemental O ₂			YES		NO				
Temp			≤35.0	35.1-36.0	36.1-38.0	38.1-39.0	≥39.1		
Sys BP	<70	70-90	91-100	101-110	111-219			≥220	
Heart Rate	<40		40-50		51-90	91-110	111-130	131-140	>140
Level of Consciousness					Alert			Voice or Pain	Unresponsive or fitting

New Zealand Early Warning Score Escalation Pathway

ZONE	Indicator		Mandatory Action	SCORE
YELLOW	Total EWS 1-5	➤	Manage pain, fever or distress. Increase frequency of vital sign monitoring	1
ORANGE	Total EWS 6-7 Acute illness or unstable chronic disease	➤	Discuss with nurse in charge and inform PAR nurse. Increase frequency of vital signs monitoring.	2
RED	Any vital sign in the red zone or total EWS 8-9 Likely to deteriorate rapidly	➤	Registrar review within 20 minutes & consider ICU referral. Inform PAR nurse, house officer and nurse in charge. Increase frequency of vital signs monitoring.	3
BLUE	Any vital sign in the blue zone or total EWS 10 or more Immediately life threatening critical illness	➤	Dial 777, state 'Medical Emergency Team' & give your location. Support Airway, Breathing & Circulation	MET

How to contact PAR

For general information & patient referral, please contact the PAR Nurse on duty by ringing **#6785** from any internal hospital phone (available 24 hours per day, 7 days per week).

The PAR Team is led by a Clinical Nurse specialist, Sarah Imray (sarah.imray@ccdhub.org.nz) with support from the PAR Clinical Liaison, ICU specialist Dr. Alex Psirides (alex.psirides@ccdhub.org.nz). Both should be contacted in the rare event you have any concerns or issues about the PAR service. The PAR nurses are an excellent resource to help you look after patients in the ward environment.

3.8 Tracheostomy Review And Management Service (TRAMS)

TRAMS

(<http://www.wellingtonicu.com/AboutUs/Services/TRAMS/>)

TRAMS are a multidisciplinary team based in ICU set up to manage patients discharged to the ward with tracheostomies in-situ. The service is led by Tom Andrews & Lynsey Sutton (ICU Clinical Nurse Specialists) & consists of the North Pod ICU specialist of the day, a Speech & Language therapist and a physiotherapist. TRAMS visit every patient with a percutaneously inserted tracheostomy until they are decannulated (the tracheostomy is removed) or the patient is discharged from Wellington Hospital. The service makes decisions along with the patient's primary team around tracheostomy weaning and provides an education resource for the ward staff who may be unfamiliar with looking after patients with tracheostomies. The service does not follow up patients with tracheostomies inserted for ENT purposes as these are looked after by their own team. Most tracheostomies in ICU are removed before the patient is discharged but particular patient groups (patients with traumatic brain injuries for example) may require prolonged insertion. The service currently reviews about 20-30 patients per year with each patient requiring multiple reviews.

All TRAMS visits occur during office hours, usually after the morning X-ray meeting. Although they are attended by senior medical staff, registrars have the opportunity to join the team to learn about tracheostomy management if they wish to do so. Any emergency issues that arise are usually dealt with by the MET team.

3.9 Hand hygiene

Nosocomial infection is a reality in intensive care. We have a large number of sick patients in an open environment and cross infection is a significant risk.

The single most important thing you can do to reduce this risk is to maintain excellent standards of hand hygiene. Doctors grossly overestimate how often and how well they clean their hands.

Our policy is simple:

- **Alcohol hand gel should be used before and after every patient or bedspace contact**
- Hands must be cleaned before every sterile procedure
- Eye protection should be worn for all procedures (including intubation)

ICU staff are regularly audited for hand hygiene compliance. Results can be seen on the [ICU dashboard](#). Alcoholic hand gel and hand washing facilities are available by every bedspace.



Your behaviour and safety with infectious diseases (measles, influenza, tuberculosis, meningococcus, MRSA) is predicted by your usual behaviour. Intensive care staff are at risk because you don't know prospectively which patient will be the index case in an outbreak.

4.0 TRAINING AND ASSESSMENT

The Intensive Care Service is recognised for formal training in intensive care.

Registrar positions are recognised by the following Colleges:

- *College of Intensive Care Medicine (CICM)*
- *The Australian & New Zealand College of Anaesthetists (ANZCA)*
- *The Royal Australasian College of Physicians (RACP)*
- *The Royal Australasian College of Surgeons (RACS)*
- *The Australasian College of Emergency Medicine (ACEM)*



At the beginning of your run you will be interviewed by one of the ICU supervisors of training to gain some background information about yourself, your past experiences, your training requirements and your expectations of the run. You will also be asked to complete an online questionnaire to help us meet your training needs.

All registrars will be informally assessed mid-run and interviewed to see how their initial period has gone and if there are any issues that need addressing.

All registrars will have a formal assessment at the completion of their run with an interview during the last few weeks.

The practice of intensive care is such that everything you do will be able to be observed by the specialists the following day. This peer assessment is an important part of intensive care practice and ensures that everybody practices to a high standard. You will undoubtedly make errors of judgement and errors of management during your time here; this is how we learn. It is quite likely these will be brought to your attention in a constructive way so that you can learn. In particular electrolyte, fluid management and circulatory management will become clearer as the run progresses.

Intensive care and high dependency patients frequently have input from multiple teams. An important part of our practice is being able to coordinate patient management and discuss patient care with multiple other specialists and patients' families. In particular this will test your interpersonal and communication skills.

We expect a lot from our registrars and will make a large effort to identify areas of your practice or performance that can be improved. We do this to teach you and help you to become better doctors. Please do not be offended if you are spoken to about areas of your practice that can be improved.

5.0 ADMISSIONS, DISCHARGES AND TRANSFERS

5.1 Admissions

5.1.1 Elective or Booked Admissions

These are admissions which have been notified to us and entered in the admission diary. They can be separated from acute admissions in that we can postpone or cancel the admission if we do not have enough vacant beds.

We provide high dependency care as well as intensive care and there is a policy of general acceptance of most patients for elective high dependency care allowing for bed availability. All requests for elective admissions must be discussed with the senior medical staff and written in the admissions book.

It is the responsibility of the referring team to check we have a bed available before starting their planned procedure. All elective admissions are also discussed at the morning handover meeting each day. In the even of number of requested beds exceeding those available in ICU, priority on which cases proceed is determined by the theatre teams, not ICU staff. Please do not get involved with attempting to resolve potential conflicts; if in doubt, escalate to the on-call specialist.

5.1.2 Acute Admissions

All requests for acute admissions must be discussed with and approved by the on-call ICU specialist or SR. Admissions can come from in-patient wards, ED, theatres/PACU, or other hospitals (usually within our tertiary catchment area).

WARD/ED/THEATRES/PACU

You can either see the patient first or discuss the request with the specialist. **Always document your review in the patient notes**, especially if we do not transfer the patient to the unit.

INTERHOSPITAL RETRIEVALS

These patients vary from referrals for tertiary medical/surgical care, referrals for tertiary intensive care, or referrals because another unit is full or they don't provide intensive care (resource referrals).

The mechanism for accepting patients will vary:

- (a) Tertiary medical/surgical referrals should be accepted by the Wellington specialist team concerned. We may get the first phone call or it may be the second or third. We will take responsibility for coordinating the referral to help minimise the number of outside phone calls the referring team (who are often also directly involved in looking after the patient) has to make.
- (b) Tertiary intensive care referrals are accepted by us but we must ensure that a primary team is also found within Wellington Hospital to manage them (e.g. a patient who develops multi organ failure post laparotomy will require acceptance by the local surgical team on-call even if their reason for transfer is not for further surgery).
- (c) Resource intensive care referrals are managed as (b).
- (d) Acute trauma referrals may be a combination of (a), (b) and (c). It is often appropriate to accept the patient, begin organising the transfer, call the on-call ICU specialist and then

discuss with other surgical teams. Where possible call the surgical specialist yourself, present the details and ask them to call the referring doctor.

All interhospital retrievals by aeromedical means mostly use aircraft provided by Life Flight. Co-ordination will be conducted either by the flight coordinator (during weekday office hours), or by the on-call flight nurse. **Please do not get involved with this process unless specifically requested to do so** as this is likely to hinder established communication channels. No transfer occurs without mandatory notification to the on-call ICU Specialist who must approve every transfer. All road retrievals (typically from Hutt, Kenepuru, Wakefield and sometimes Wairarapa Hospital) are performed using vehicles provided by Wellington Free Ambulance.

DECLINED REQUEST FOR ADMISSION

Admission can only be declined by an ICU specialist or SR (in consultation with the specialist). Even if the unit is 'full' the specialist will take responsibility for declining admission or arranging alternate placement; rarely this may involve moving a stable non-tertiary patient to another ICU. Please liaise with the PAR team if you feel a declined admission would benefit from follow-up.

IMPORTANT: All admissions must have a primary team. Remember to call an appropriate registrar about patients that come from ED or another hospital. Some patients may be admitted under the ICU specialist on-call (usually medical patients admitted directly from ED or transferred from another hospital). All patients admitted to ICU from a Wellington hospital ward are admitted under their named hospital admitting team. The on-call paediatrician **must** be notified of all children admitted to ICU (if they are not the referring service).

5.2 Discharges and Transfers

DISCHARGES

All patients to be discharged from the Intensive Care Unit must be discussed with the on-call specialist or SR first. Once the patient is medically well enough to be discharged the registrar will discuss this with the primary team. **The primary team must accept the patient before they are able to be moved from the unit.** Once medical acceptance has been gained, then the nursing staff will discuss with the nursing staff of the ward to ensure they have enough resources to look after the patient. Please see the orientation manual section with regard to the documentation that must be completed before discharge.

TRANSFERS TO OTHER HOSPITALS

Patients may be transferred to a different hospital for two reasons. Firstly they may be returning to the hospital they were transferred in from or, on occasion, we may transfer a patient to a different intensive care unit (usually beginning with the geographically closest) when we do not have sufficient resources to provide safe care.

TRANSFERRING TO A WARD IN ANOTHER HOSPITAL

The registrar should discuss the patient with the registrar or specialist who will look after the patient at their hospital. Once the patient has been accepted by the medical staff, then the transport arrangements can be put in place. It is still appropriate for the intensive care nurses to communicate with the ward nurses to ensure that they have sufficient information about the patient. In general, patients referred in from another hospital will be transferred to a ward in Wellington Hospital before being transferred back to the ward area of the referring hospital. Patients being transferred to a ward in another hospital are sometimes transferred to that hospital's ICU/HDU (if they have one) pending assessment prior to a final transport to the ward.

TRANSFERRING TO ANOTHER INTENSIVE CARE UNIT

All patient transfers to intensive care units in other hospitals will be arranged by the on-call specialist. They will firstly discuss arrangements with the doctor responsible for the intensive care unit in the other hospital. The patient may be transferred because they are returning to the hospital they were referred from, or on occasions they may be transferred because we do not have sufficient resources in Wellington Hospital or require specialist care (such as the regional spinal unit in Christchurch or the national burns unit in Middlemore). In general, the patient will be accepted by the doctors responsible for the intensive care unit, but the patient must also be accepted by a primary team in the other hospital as well. This referral can either be done by our intensive care staff or by the primary team within Wellington Hospital.

6.0 DOCUMENTATION

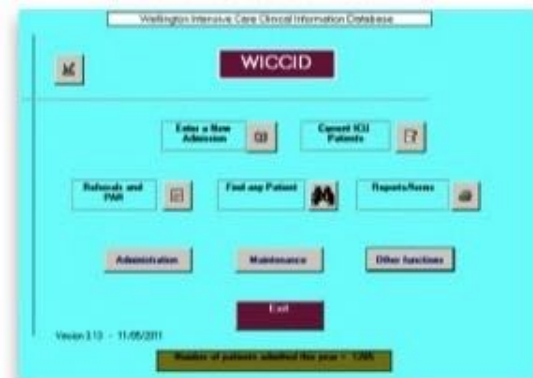
6.1 General Information

ADMISSION

All patients admitted are to have a written admission note, printed from the ICU clinical database (WICCID). This forms part of the patient's paper medical records. It should cover:

- Prior health status
- Sequence of events leading up to ICU admission
- Assessment of vital systems
- Diagnosis
- Injury list (for trauma patients)
- Treatment already undertaken
- Treatment and investigations being planned
- Social: what the family have been told, what needs to be covered with the family in subsequent meetings and any other relevant points

All trauma patients should have a Major Trauma Admission Form completed on admission (available in ED or in Flight Nurses packs).



DAILY UPDATE NOTES

A daily entry in the written medical notes will be made. These should describe:

- Changes and events of the last 24 hours
- Problems and plans for the next 24 hours
- An organ systems-based assessment of current progress

All invasive procedures need to be fully documented in the clinical notes and in WICCID (the latter allows a centralised record & also provides registrars with personal procedure summaries available at the end of the run).

Long Day Registrar responsibilities:

The long day registrars must note the plans of the day on each patient. These should be documented on the 24 hour ICU flow chart. The long day registrars will also note procedures to be done or booked, consultations to be sought and information acquired etc. The long day registrars will also update the remainder of the 24 hour ICU flow charts, in particular the fluid and electrolyte prescription for the day and the desired physiological parameters, for example mean arterial pressure, ICP etc.

Short Day Registrar responsibilities:

The short day registrar should record a daily progress note in the clinical record as noted above.

Night Registrar responsibilities:

The night registrars should ensure that patients who require a morning chest x-ray have this ordered before 7am (please ensure clinically relevant information and/or a clinical question is included in the request to allow the radiologists to provide a useful report); all patients who have been in the unit for over 24hrs should have their APACHE data entered into the ICU database; any patients who are likely to be discharged the following day (e.g. straightforward cardiacs or HDU admissions) should have their discharge summary prepped to improve efficiency the following day. Blood tests on MAP should be signed off and results acted on as appropriate.

DATA QUALITY

Much of the audit data that allows us to run the unit, contribute to the [ANZICS database](#), and conduct high quality research will be collected from the clinical database. As such, it is important that all data entry be of high quality and as accurate as possible. Training will be provided for you during orientation.

DRUG CHART

All drugs are to be charted on the National Medication Chart. This is a standardised record of the patient's drug prescription and administration. To avoid the risk of medication errors it is essential that medications are charted legibly using block letters and units. Avoid extraneous zeroes following the dose. Allergy status must be filled in for all patients. Intravenous fluids and feeds are charted on the 24 hour ICU flow chart. Use generic names, not proprietary names for all medications (e.g. prescribe metoclopramide not 'Maxolon'). If no convenient generic name exists, use the trade name in quotes, for example 'Augmentin'.

For all postoperative cardiac surgical patients use the pre-printed cardiac drug chart. It contains all the routine medications a patient will likely require with us. As for any other prescription, you need to ensure there are no contraindications for each of the drugs. Fill in the dosage **and sign each drug separately**. Ensure that there are no duplications with pre-existing drug charts. On discharge from ICU you must cross off all the drugs which are only applicable to ICU and chart oxygen and maintenance fluids if required.

The Intensive Care Unit Drug Manual is available in printed form and as an electronic version on both the Intra & Internet (<https://drug.wellingtonicu.com/>)

Intensive Care patients are often on multiple medications which change on regular basis - good housekeeping and adherence to medication charting standards is essential to prevent medication error in these patients who are particularly vulnerable to harm.

DISCHARGE SUMMARY

A printed medical discharge summary from WICCID is required for all discharges, transfers and deaths. The ventilation hours information must be completed as it is used to determine coding and funding.

The ICU discharge summary is heavily relied on by other teams inheriting the care of our patients, and is especially important for specialists at other hospitals when patients are transferred.

Essential elements to include on the discharge summary (especially important for complex or long-stay patients) include:

- A summary of what the key problems were, how we investigated them, how we managed them, and which other speciality teams were involved (named consultants where possible)
- A clear statement of the final diagnosis
- Any complications during the admission (e.g. VAP, AKI)

- Any followup still required (e.g. an incidental finding on imaging that needs further investigation, or an investigation result still pending)
- Whether repeat ICU admission should be encouraged or entertained - i.e. if there was a discussion on limitations on care then this should be clearly documented

For long stay and complex patients you are encouraged to ask a senior registrar or specialist to review the discharge summary you have prepared before it is finalised.

6.2 Death

Whenever a patient dies you will need to:

- Complete the ICU electronic clinical database record and file the discharge summary in the patient's notes
- Complete both a death certificate (online) & cremation form **only if the patient is not a Coroner's case**. All death certificates must be accompanied by a cremation form even if the patient is not for cremation; some families may change their mind later & the paperwork cannot be subsequently completed by another doctor who did not view the body after death
- Use the form letter to notify the general practitioner and send an ICU Discharge Summary
- Complete details on the patient death task checklist (included in the 'Death Pack' along with all other required paperwork)
- Complete a 'Deceased Patient Hospital Discharge' using the Concerto patient data system - many of the details can generally be cut & pasted from the ICU database discharge note. Remember this is primarily going to the GP, so they will be interested in what happened to the patient, and they may be a point of contact for the patient's family if they have questions.

Note:

Should the case be accepted by the Coroner, **do not complete a death certificate or cremation form** as these will be completed by the Coroner or their officers. This documentation is kept in pre-packed folders (the 'Death Pack') in the unit - please ask the Ward Clerk or ACNM if you can't find it. CCDHB does not provide RMO remuneration for the completion of cremation forms.

CORONER'S ACT

A copy of the criteria for referral to the coroner is attached (Appendix 3). If there is any doubt about whether a patient should be referred or unusual circumstances, then the coroner should be contacted directly. If there is any uncertainty, please discuss this with the on-call specialist who should be informed of all deaths on the Unit anyway.

It is recommended that all ICU doctors read the [New Zealand Ministry of Health guide to Death Certification](#). It contains helpful information & examples of what can & can't be written on a death certificate. Death certificates are audited at the Friday audit meeting.

7.0 PROCEDURES IN ICU

GENERAL

Procedures are a routine part of intensive care practice but can be hazardous. It is important that all lines are inserted carefully, safely and in a sterile manner. If you are not sure of your own ability to carry out the procedure, please ask. We have had significant morbidity from complications and we take these procedures seriously.

There is a place in the clinical database to record procedures you perform so they can be summarised to add to your training record at the end of your ICU run. Ensure all invasive procedures you carry out are documented in the patients notes, including the name of the proceduralist (and supervisor if required), indication, procedure note, any medications

administered (must also be charted on drug chart), complications and further plans (e.g. a chest x-ray).

7.1 Central Venous Lines (CVL)

All CVLs are to be inserted using the CLAB (Central Line Associated Bacteraemia) prevention packs.

By default we use 20cm quad-lumen central lines which are all chlorhexidine free. All lines are inserted under ultrasound guidance. All lines are to be secured with a dressing covering the line from the skin insertion site to the StatLock™.

Femoral venous line insertions should be avoided unless no other route is possible. The CLAB documentation should be completed after every line insertion. The bedside nurses will check your compliance with the insertion bundle; this includes donning both a disposable hat & face mask before insertion. Lines should be inspected daily, and removed when no longer required. If unsure, ask a specialist or SR.

Haemodialysis catheters, or Vascaths (for continuous renal replacement therapy or plasmapheresis): preferentially we use 15cm Vascaths for right internal jugular insertion & 20cm for the left. They should not be inserted via the subclavian route. Further details will be given as part of orientation. As with central lines, femoral venous insertion should be avoided where possible.

No patient is able to be discharged from ICU with a femoral central line in-situ.

All central venous lines are removed by nursing staff at medical request.

All internal jugular or subclavian central venous line insertion must be checked with a chest X-ray as soon as possible. Even (especially) if the insertion attempt was unsuccessful, a chest X-ray should be performed to exclude damage to the lung or surrounding structures (pneumo- or haemothorax). This is especially the case in patients receiving positive pressure ventilation.

7.2 Arterial Lines

For estimated stays less than 48 hours a short peripheral cannula (20 gauge) is acceptable.

If the patient is expected to stay more than 48 hours, this short cannula should be replaced using a long soft arterial line. This must be inserted using a sterile technique with gloves. A sterile pack with drapes must be used and not a small dressing pack. Do not cut corners; a subsequently infected arterial line will require surgical excision of the artery. Leave 10 cm of these long lines external and looped towards the elbow, not around the thumb. No suturing is required when long lines are used. The lines should be secured with a transparent Tegaderm and the site inspected daily as for central venous lines

7.3 Pulmonary Artery Catheters

As for central lines. Do not routinely send catheter tips unless a catheter-related bloodstream infection is suspected. Be certain you are in a vein before you dilate to insert the sheath. It is large and may need surgical removal if its in an artery. If you dilate an artery in error, notify the ICU specialist on-call & call a vascular surgeon. **DO NOT attempt to remove the line.**

7.4 Intercostal Drains

Intercostal drains must be inserted using a sterile technique with gown and gloves. We have two types of intercostal drains - both are multi-holed drains & neither have a trocar. Insert drains using a blunt dissection technique. If required for drainage of a pneumothorax insert a 24-28Fr sized

drain. For drainage of blood or empyema, size 28 - 32Fr drain is preferred. These drains are not changed routinely and are sutured in place using nylon. Do not insert a purse-string suture. Place all intercostal drains on 10 - 20 cm of water suction.

For simple pleural fluid it is recommended to use a smaller drain (6-7 Fr) inserted by Seldinger technique, from a blunt 16G needle/guidewire method. This is a tidy, safe method with minimal morbidity but is not suitable for blood, air or pus.

7.5 Urinary Catheters

These will be changed when blocked but not generally as a routine. In renal failure patients that are totally anuric it is reasonable to remove the catheter, however in all others accurate measurement of urine production is needed.

7.6 Endotracheal Tubes (ETT)

INTUBATION

Capnography must be used for all intubations in the Emergency Department and Intensive Care. There is capnography available in every bed space. Intubation is recognised as being a very good way to expose yourself to any respiratory infections present. Wear a visor and/or mask. Continuous capnography is mandatory for all ventilated patients. This includes a real-time end-tidal CO₂ trace as well as the value derived from this. Displaying the number alone is not acceptable.

If you need urgent airway assistance and there is not an ICU specialist immediately available, the telephone numbers for the duty anaesthetist (#6899) and anaesthetic technician (#6345) are printed on top of the ICU airway trolley. Video laryngoscopes are available on all airway trolleys within the ICU along with supraglottic airways, a bougie, direct laryngoscopes, a variety of endotracheal tubes, and a CICO (Can't Intubate Can't Oxygenate) kit.

POSITIONING

This is assessed clinically with the cuff of the tube placed just below the cricoid ring and this needs to be verified radiologically. The tip of the endotracheal tube should be around 2 cm above the carina opposite the second or third thoracic vertebra. A chest X-ray is mandatory after every intubation.

CHANGING

Unless occluded or another mechanical problem, for example a cuff leak, endotracheal tubes are not routinely changed. Shortening the endotracheal tube by cutting it should not be performed unless directed by a specialist. In patients requiring prolonged ventilation, the tube must be reviewed with consideration of tracheostomy. Reinforced tubes (typically used in neurosurgical or spine procedures) are not acceptable in the ICU as, if bitten down on, they may completely occlude & not re-open when the patient relaxes. As such, they must be changed for a standard tube in theatre prior to the patient returning to the unit. It is unit practice to ask any patient arriving with a reinforced tube in-situ to return to theatres for the tube to be changed to a standard endotracheal tube.

TRACHEOSTOMY TUBES

Portex or Shiley tracheostomy tubes are most commonly inserted in our ICU by the ICU specialists using a percutaneous (rhino dilator) technique. All patients with tracheostomies in-situ must have end tidal capnography monitored at all times (even if breathing spontaneously). It is routine to insert a tracheostomy inner tube in all ICU patients. Any patients discharged to the ward must also have a tracheostomy with an inner cannula in-situ. They will be followed up routinely by the Tracheostomy Review And Management Service (TRAMS - see section 3.8)

7.7 Gastric Tubes

All intubated patients should have a gastric tube unless a strict contraindication exists. In patients in whom duration of intubation and mechanical ventilation are expected to be less than 12 hours, for example a postoperative cardiac surgical patient, it is reasonable to not insert a nasogastric tube. Size 12 - 16 French tubes are acceptable and these are inserted either orally or nasally if there is no contraindication. They are not changed as a routine. Gastric tubes are secured in place with Elastoplast or similar. 'Bull-ring' devices are placed in patients in whom nasogastric tubes are recurrently removed but still required.

7.8 Echocardiography

The ICU is equipped with both a Philips Sparq machine & two procedural ultrasound machines. The former has transthoracic, transoesophageal and vascular access probes with needle detection software to aid line insertion. Ultrasound is used routinely to insert lines, diagnose & tap pleural effusions etc. A number of the ICU specialists are trained & credentialed in echocardiography and can help provide this service to guide treatment. It is important to receive training on the use of this machine from one of the specialists prior to use & some familiarisation will be provided during orientation. Proper care and cleaning will help prevent the expensive probes from damage. Due to the high cost and potential risk of the oesophageal probe, transoesophageal echocardiograms (TOE) should only be carried out by ICU specialists, cardiac anaesthetists, or SRs specifically trained in their use.

8.0 ORIENTATION LECTURES

Please see the orientation timetable described previously for what is covered during orientation. No pre-reading is expected prior to beginning your ICU run although it is not discouraged.

8.1 Emergencies

We need to be prepared for a variety of emergencies and system failures. You are expected to know what to do, so please make sure you ask if you don't. Generally the ICU ACNM (Associate Charge Nurse Manager) on duty will manage the situation and it is wise to follow their directions. The situations you need to consider are:

Fire: Phone number to call & location of alarm & fire extinguishers. Evacuation plan for staff and patients

Earthquake: Safe evacuation zones, safety for yourself, other staff members & patients

Power, phone system or oxygen loss: What to do

Ensure you know the location of the following items: Defibrillator, central lines, chest drains, ventilators, portable ventilator, capnograph module, portable monitors, bronchoscope, intravenous fluids, cardiothoracic folder, policy folders, emergency management folder, ultrasound machines, chest re-opening trolley. These will be shown to you during your physical orientation to the unit.

9.0 MEDICAL POLICIES

9.1 Blood Testing in Intensive Care Patients

REGULAR BLOOD TESTS

'Routine' blood tests in ICU consist of those sent to the laboratory and those processed on the ICU blood gas analyser. The former consist of two groups - Panel A and Panel B. These are:

Panel B: Sodium, Potassium, Urea, Creatinine, Glucose, Calcium, Phosphate & Magnesium

Panel A: as above plus Albumin, Bilirubin, ALP, ALT, Full Blood Count & Coagulation Profile

The ICU gas analyser provides a standard profile with basic electrolytes, haemoglobin, lactate & chloride. All bloods processed by the analyser are automatically added to the patient's electronic clinical lab record.

The nursing staff will collate any results onto the daily ICU blood sheet which is kept by the patient's bedside. Any additional tests are performed at the request of the medical team and can be added retrospectively to previous blood tests after discussion with the laboratory.

TIMING	Arterial Blood Gas	Panel A	Panel B
On ICU Admission	√	√	
Morning 05:00	√	√	
Afternoon 17:00	√		√

NON REGULAR**Arterial blood gases**

Use continuous SpO₂ monitoring to adjust inspired oxygen concentration. Confirm PaO₂ with the regular timed blood gases. Measure when ventilation has been adjusted. PaCO₂ can be compared to the end-tidal reading and used to adjust minute volume on the ventilator without the need to repeat arterial sampling. Do not routinely measure blood gas during ventilatory weaning but wait for the next regular test. Check if there is clinical evidence of difficulty breathing.

Urea, Creatinine & Electrolytes

May be four hourly (between regular tests) for very sick patients but basic electrolytes (sodium & potassium) are available from the gas machine.

Glucose

This is measured by the unit gas machine with the regular gases but can also be measured with a bedside glucometer in patients without arterial or central venous access.

Liver Function Tests

There are no indications for more than once daily testing except in paracetamol overdose or fulminant hepatic failure.

Laboratory Full Blood Count

The haemoglobin is measured by the unit gas machine and will be measured as part of the routine eight hourly gases. A lab FBC will only be needed where we want to check the platelet count.

Coagulation Profiles

May be needed each morning for very sick patients or patients on heparin or warfarin. Other times are as requested. If the patient is actively bleeding, frequent repetition may be needed to guide appropriate blood product replacement.

9.2 Medications

REGULAR MEDICATIONS

The following medication should be charted for all patients who are expected to stay more than two days.

Enoxaparin: 40mg subcut daily at 1800 hrs (this is always administered in the evening to minimise bleeding during invasive procedures that may be performed during the day). The dose is decreased to 20 mg subcut daily in renal impairment.

ORAL THRUSH

If the patient has oral thrush give Nilstat 1ml QID orally.

GASTRIC STRESS ULCERATION PROPHYLAXIS

Indicated if:

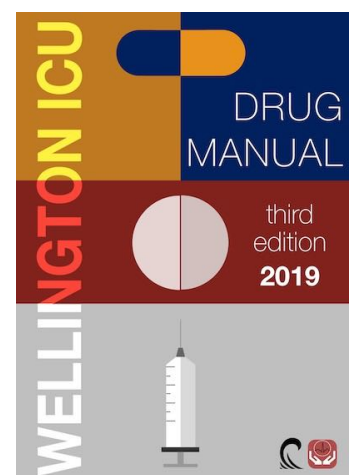
- ventilated for > 48 hours
- coagulopathy after 24 hours
- previous history of GI bleeding
- not enterally fed
- other risk factors e.g. on steroids
- Patient is already on PPI as a regular medication

Give Omeprazole 40 mg po or NG OD (iv only if no enteral route available)

Stop prophylaxis when gastric enteral feeding established (not jejunal) and no other risk factors

THE ICU DRUG MANUAL

The recommended indications, dosage & administration of all medication commonly used in Wellington ICU is available in printed & electronic form. There are several copies of the the manual available in two volumes in ICU at all times. The latest version of the manual can also be [downloaded as an indexed, searchable PDF](http://drug.wellingtonicu.com) & will shortly also be available online as a website specifically designed for use by the bedside on handheld mobile devices (optimised for iPhone & iPad screen sizes) at <http://drug.wellingtonicu.com>



9.3 Medical Orientation to the Flight Retrieval Service

“You can’t beat Wellington on a good day” but even on a good day, given we are the windiest city in the world, the approach into Wellington airport is generally turbulent.

Please let us know if you are not a good flyer; we need to be aware of this. We carry oral anti-emetics but these need to be taken ideally one hour before flight. If this isn’t satisfactory then you need to make arrangements for someone else to cover for you. There is no shame in deferring a flight to a colleague & there always seems to be someone around who will happily fly back into a 100km/hr southerly.

Please ensure that you are fit to fly; it is extremely uncomfortable and even dangerous to fly with upper respiratory tract infections including the common cold, blocked ears, sinus, or the ‘flu. You will be of no help to yourself or the patient. Please make arrangements with your colleagues to replace you, as you will not be allowed to fly.

LifeFlight Trust, our main provider, operates a Bell 117 helicopter (twin engine) and a two British Aerospace Jetstream pressurised aircraft. Occasionally we may be required to use other aircraft but always pressurised. We fly at a cabin pressure of sea level to 4000 feet maximum depending on the patient’s condition.

The flight nurses have been well trained in this environment and will be of great assistance. Please remember to communicate your intent at all times as they will make things easier for you.

Safety Orientation

Your safety is our concern. It is an CAA requirement that you are given a thorough safety briefing. You will be taken out to the Life Flight base to be orientated to both aircraft. You will be given a form to be signed off by the operation manager, or senior crew person once this has been done including:

- Role of the crew and responsibilities
- Safety zones around the aircraft
- When to approach
- How to use the communication equipment
- Placement of emergency equipment in the aircraft
- Use of emergency exits
- Loading and unloading of the patients
- Securing of self and equipment during flight

Hotline

There is a toll free 0508 direct phone line into ICU to allow people to easily contact us. This is primarily for organising flights but it may be used for patient referrals and questions. You can use it to contact ICU when out doing a transfer. The number is 0508 935 535 (0508 WELLFLT).



Online Tracking

All retrieval aircraft can be tracked live online using the Wellington ICU website here: <http://www.wellingtonicu.com/AboutUs/Services/Flight/Track/>

This page also provides details of all the hospitals within our tertiary retrieval area as well as expected transit times by helicopter, fixed wing and road.

Non-ICU Transfers

If a call comes in on the hotline, it is answered by the ICU ACNM and is passed on to the flight coordinator during office hours. After hours this is organised by the flight nurse on call.

Always discuss with the ICU specialist on for the day if you are asked to help on a flight. It is useful to discuss potential pitfalls and anticipated clinical course with the specialist before you leave for the retrieval. **Do not leave the unit without the specialist's permission.**

ICU Transfers

Follow guidelines and complete the assessment sheet with all the information. Liaise with the ICU ACNM who will page the flight coordinator to activate the flight team. Check appropriate services are notified and happy to accept care for this patient.

If you are discussing a transfer you can save time and make your job easier by getting the referring team to prepare the patient as much as possible. This may be by intubating if required, inserting an arterial line and/or central line, NG tube, getting blood results or repeating blood tests, giving anti-emetics and getting X-rays so that these are available on our arrival.

Your Role

Although we average 80-100 transfers per month, doctors are usually only required on half of these. Doctors accompany patients that may require airway management and/or critical circulation treatment.

Retrieval/transfers are categorised according to the acuity of the patient into the following:-

Category A: ventilated or requiring advanced life support or unstable - always accompanied by a doctor

Category B: acute incident, generally non-ICU patients often require a doctor depending on condition, need for airway management and intervention

Category C: stable returning to home hospital or palliative care - do not require a doctor

The patient category decision is made by the flight coordinator or flight nurse, in conjunction with the ICU specialist on-call.

Please note that your role is as **part of a team**. Although you are usually the most medically experienced, the flight nurse & crew member who accompany you are more experienced in the aviation environment and their knowledge should be collectively utilised for the benefit of the patient. Please do not feel the need to take over simply because you are the flight doctor. Similarly, when you arrive at the referring hospital, whatever the quality of care that has been provided, always be polite & professional with the referring team (see 'Relationships' below). The key to safe timely transfers is good communication both with the referring & home team. On many occasions you may be bringing the patient back to Wellington for urgent surgical intervention; be aware that the more notice you give to them, the better prepared they will be. If the patient's condition necessitates it, or they deteriorate in-transit, it may be appropriate to transfer straight to theatres; if this is the case it should be discussed with the ICU specialist as soon as possible.

Preparation of the Patient Prior to Transfer

- Do it on the ground, not in the air
- More is missed by not looking than not knowing
- Responsibility for the patient is gradual until hand-over is complete
- No airport runway hand-overs (except the Chatham Islands for stable patients)

General Aims for Safe Patient Transfer are:

Stable ABC Primary and Secondary survey

If in doubt – intubate (generally if GCS<12)

Trauma films if possible – do not delay, take necessary precautions

All head injuries are neck injuries unless already radiologically cleared (by CT)

Stable vital signs

Maintain oxygen saturation >94%

Adequate IV access, two large bore IV lines for acute patients – CVP if it will not delay

Arterial lines preferable for monitoring in flight as BP cuffs are not accurate – do not delay

Adequate Hb >70g/L

Adequate hydration

No active bleeding

Be aware of mechanism of injury and undiagnosed complication, communicate concerns to the flight team so necessary precautions and adjustments can be made

You must discuss every patient with the on-call ICU specialist before leaving the hospital

Relationships

Remember that the referring team have been looking after the patient and are responsible for the patient when you arrive. They will gradually hand over that responsibility to you, as you discuss the patient. Be patient, listen, and thank them for the care they have provided. Explain why you are changing the infusions, putting in new lines or altering what they have done.

You work as part of a small team and your input is vital to ensure the best outcome for the patient. Communicate clearly with the flight nurse and crew. Please be aware that your interactions with your colleagues form part of your overall assessment & the opinions of the flight team are sought and incorporated into this.

Documentation

Please write a flight report on the last page of the Transport Record, this is then photocopied and left in the patient's notes. All difficult or problematic flights are audited regularly & you will have an opportunity to discuss them with the ICU specialists if you so wish. Similarly if you have any concerns with the care provided at other hospitals, flight nurses or crew members, you should discuss them with the flight service ICU specialist (Dr Alex Psirides)

Dress Code

We expect you to represent Wellington ICU in a professional and courteous manner that includes the correct attire. The dress code required for all those on the flight team, is a flight suit which is stored in the transit lounge & available from the flight nurse. You may wear your own clothing underneath it. Please keep a pair of boots or solid closed shoes at work, as it is unsafe to have slip ons or unprotected toes for retrievals. Much of the equipment we need to transport is heavy. A broken toe from a dropped oxygen cylinder is very painful.

Insurance

If undertaking any activity for Wellington Regional Hospital which invalidates your own personal life insurance, C&CDHB will cover staff up to a maximum of \$1 million for medical staff.

Whilst travelling in or on any vehicle or aircraft as part of CCDHB business, staff are covered up to 5 times their personal salary for death or a lesser amount for injury to a maximum of \$250,000. This is over and above your own personal life insurance.

Website

More information on the service, types of patients transferred, aircraft & College of Intensive Care Medicine Minimum Standards for Transport can be found on our website.

<http://www.wellingtonicu.com/AboutUs/Services/Flight/>

Contacts

If you have any concerns over any flight retrieval, please discuss them with the ICU specialist on-call immediately. If you have any procedural or organisational issues, please discuss them with Dr Alex Psirides, the Clinical Leader of the Flight Retrieval Service on #6137.

9.4 Advanced Analgesia

Patient Controlled Analgesia (PCA) Prescriptions**Usual drugs and dosage for PCA**

Morphine 100 mg in 100ml saline (1mg/1ml)

Bolus dose: 1mg (1ml)
Lockout: 5 minutes
Hourly limit: 12 mg (12ml)
Background infusion zero

Fentanyl 1000 micrograms in 100ml saline (10 micrograms/ml)

Bolus dose: 1ml (10 micrograms)
Lockout: 5 minutes
Hourly limit: 12 ml (120 micrograms)
Background infusion zero

Prescribe dose and hourly limit in volume as the PCA cannot be set in mcgs.

Ketamine infusion: 400mg in 100ml saline (4mg/ml), run at 0-4ml/hr

Droperidol: 2.5 mg may be added for the treatment of nausea and vomiting

For prescriptions outside these parameters please discuss with the Acute Pain Management Service (APMS) - #6449 (answered after-hours by the duty anaesthetist or anaesthetic registrar)

Background infusions may be prescribed, in discussion with APMS, for patients with constant pain not being well managed with PCA boluses alone. Continuous infusions are also useful for patients who are opioid tolerant and require opioid maintenance.

Please chart the PCA on an advanced analgesia form, as well as on the national medication chart

Epidural Catheters

We rarely insert epidural catheters in ICU, but postoperative patients often come from theatres with an epidural catheter in situ.

The usual solution used is 0.125% Bupivacaine with 2 mcg/ml Fentanyl. The rate depends on the level of insertion (lumbar / thoracic), the size of the patient and the type of surgery. Check the block level with sensation to ice on admission and adjust the rate accordingly. Epidural infusions will cause sympathicolysis to some degree. The resulting hypotension should be treated with intravenous fluids and/or vasopressors (Phenylephrine/Metaraminol/Noradrenaline), depending on the patient.

The insertion site and the neurological function mainly of the lower limbs needs to be regularly assessed. The catheters are routinely removed not later than day 4, as infection risk will increase. Please ensure that the coagulation is normal and enoxaparin has not been given in the last 12 hours before removal of the catheter (and will not be given in the 2 hours following removal). If there are any concerns, questions or problems, please contact the ICU specialist or liaise with the Acute Pain Management Service.

APPENDICES

APPENDIX 1

Communicating with Families

Introduction/Initial Meeting

Things to think about beforehand:

- Environment and setting, whom are you talking to, what are you going to talk about, what do you know about it and where do you want to end up in the meeting. Plan it ahead of time and ideally with your other team members (nurses or other medical teams).
- If communication is done well, family satisfaction is usually higher. We can make a positive impact on family wellbeing.
- Make sure you are fully informed about a patient's condition before you go into the meeting. Do not attempt to cut corners and 'wing it' - as well as being disrespectful to the family, it can affect the trust they have in the medical team going forward

Phases of conversation:

- Introductions.
- Begin with 'what have you been told?' or 'what do you know so far?' - apart from allowing them to initiate the conversation, it allows you to find out how much they know and what understanding they have of their relative's condition. It may also prevent you inadvertently directly contradicting information they have already been given, except of course where this information may be incorrect.
- Outline the phases of the discussion you are about to have.
- History of presentation, diagnosis (if known), current support, plan overnight, plan for the next day, prognosis.

Often we do not know the outcome & will be taking one day at a time.

There are three possibilities over the next 24 hours - getting better, staying the same or getting worse. If the latter of these occurs then you should mention death as a possibility.

Later on, outlining whether the patient is better, the same or worse.

Later Conversations

- Outlining progress over the last 24 hours. Is the patient the same, better or worse, what is the current prognosis? Generally if the patient is getting better, this is not an issue.
- If the patient is getting worse, then the conversation needs to move to a new stage.
- If the patient is deteriorating, it changes from 'might die' to 'likely to die' to 'most likely will die'.
- Need to emphasise continued active support, until death becomes inevitable.
- What to do if we are medically certain the patient is going to die.
- Discuss current assessment of the patient and that they are going to die.
- The kindest thing we can do now is stop the intensive care support and allow the person to die with some remaining dignity.

- Introducing other concepts – we are no longer prolonging their life, but delaying the time it takes them to die (or ‘prolonging their death’) - may be helpful.
- Or we do not wish to prolong the person’s suffering any more.

Withdrawal of Treatment

Withdrawal of treatment is the most common cause of patient’s death in Intensive Care and takes a reasonable amount of discussion. It is important to help the family get to the point where they are comfortable to be involved in the decision making process. It is a subtle point but worth bearing in mind that referring to ‘withdrawal of care’ implies that we no longer do (care), which is of course incorrect; the preferred phrase is ‘withdrawal of treatment’, or ‘withdrawal of active treatment’.

This process usually occurs in three phases:

1. Initial conversation pointing out that death or disability is a possibility
2. Interim discussions outlining that death or disability is quite likely and we may need to discuss what to do
3. Confirming that death or severe disability is a reality and discussing what appropriate measures should be taken.

It may be helpful to clarify that, ultimately, the decision to withdraw treatment aimed at prolonging life or because it is futile, is ultimately a medical decision and **we are not asking the family to decide**. As the patient’s proxy, their opinion & input into the decision making process is very important but similarly considerable post-traumatic stress may be attributed to asking the family to ‘decide to turn the machine off’.

Brain Damage

A common cause for withdrawal of treatment is brain damage following cardiac arrest, subarachnoid haemorrhage, stroke or brain trauma.

Initial discussions are the same with history, current assessment and future predictions, these usually involve possibility of prolonged coma, but need to include brain swelling leading to brain death.

Having done the initial and interim discussions we need to phrase the final discussion. This involves confirming the current neurological assessment and the predictions of neurological recovery. Outlining that this will most likely involve persistent coma and then there are two options:

- That we medically recommend withdrawal of treatment; or
- That we ask the relatives what the person would want in a situation like this

Phrasing: The kindest thing that we can do now is to withdraw intensive care support and allow the person to pass away rather than prolonging their current situation. We want them to be able to pass away with some dignity.

With older people this is not usually difficult for the families, but with younger people this may take several conversations so that they are comfortable that the outcome is awful and withdrawal of care is appropriate. We try and not put the family in the position of having to make a choice by themselves and feeling responsible for that.

Multi-organ Failure or Prolonged Ventilation

This is usually for patients who have moderate or severe functional limitations or disability prior to the current illness and who have a moderate or severe degree of current illness. It often involves some sort of infective or septic process. Again this goes in three phases of initial discussion, subsequent discussions and final discussion. Some times these may all be in the same meeting, depending on the patient.

Phases of discussion include:

- Pre-illness history (getting a good idea from the family and relatives what the person is able to do, which often is not available in the medical notes)
- Current illness history, interventions and investigations
- Current situation and level of support
- Then prognosis – the prognosis may well involve a marginal or moderate chance of survival, prolonged care in Intensive Care and hospital, prolonged recovery at home with significant limitations. There is usually a moderate chance of making a complete recovery.
- Outlining the potential outcomes from best outcome to worse outcome, emphasising that the real answer may be somewhere in the middle.
- Discussing the likely complications in the path to this recovery.

Given the prior health of the person, what do you think they would want in a situation like this? Usually we outline three options:

- Continue with full active support and see whether they get better or get worse. This would be similar to normal conversations.
- Continue active support, but not escalate it and if their condition worsens, then let nature take its course.
- Decide to stop the intensive care treatment, make the person comfortable and allow them to die.

Other Things to Think About

Time

The longer the patient is in Intensive Care, the easier it is for the patient's family to adjust. The hardest situation is for a family to be presented with the initial discussion saying that the patient is dying and there is no chance of them getting better.

For these reasons we sometimes stage the conversation over a day or two, if we think it will take this long for the patient to die and we do not wish to be completely blunt up front.

What families hear:

- Often they will hear little of what you are saying or just the initial bits

What do families want to hear:

- They are mostly interested in hearing whether the person is going to live or not and will often forget other things you say before or after.

What words to use:

- Use simple words, avoid medical jargon where possible, speak slowly.

How to end the discussion:

- Try to sort out before you start the discussion where you want to end up
- Remember you have to move with the family and be wary of how much they are able to keep up with you
- Sometimes you cannot get where you want to, because the family is having trouble understanding the initial parts of your conversation.

Waiting/Silence:

- It is important to allow the family time to take in what you have said
- Remember to wait or allow pauses after the various phases of your conversation
- Give them time to think, ask them if they have any questions
- Once you have outlined that the patient might die, may die or is going to die, allow the family time to display their distress, cry or be silent.
- **Silence is an important part of the discussions.** Stop talking & allow the family either to talk to you, each other or simply to allow what you have said to sink in. If you intend using silence as a communication tool, it may be helpful to tell other members of staff this before you enter the meeting room. This will prevent them speaking up to fill the void if it is perceived as uncomfortable.
- Listen
- Ensure they understand you - ask!

Honesty:

- It is important to be honest in your discussions.
- If you do not know things, then say you do not know. It is okay not to know everything - it is not okay to make things up if you are unsure.
- If you are unsure about something, tell the family you will find out and get back to them.

Being Understanding:

- Sympathy means that you feel sorry for the family.
- Empathy means that you feel sad or distressed yourself.
- Either of these responses are important to the family.
- Families place much importance on the fact that their doctor cared for their relatives and for them, even if there was nothing they could do to make the patient better.
- Displaying sympathy or empathy helps to show the family that you care.

Useful phrasing:

- "I am very sorry, I wish there was more we could do."
- Much of the sympathy or empathy can be transmitted by the way you look and the tone of your voice.
- Crying is sometimes a useful way of managing both your own emotions and empathising with the family.

Phrases to avoid:

- I understand how you must be feeling (because it is almost certain that you do not)

Touching:

- Physical contact with relatives can be very supportive and reassuring for the family.
- It is a matter of personal judgement for the staff member concerned.
- You have to be aware that they may not want this.
- It is not always clear how you judge or learn what is appropriate, but generally it is a feeling that you will be comfortable with. It is usually as a result of a relationship which has grown over several days or several hours of very intense emotional involvement.
- If you are not normally comfortable touching or hugging people, do not try to do this to imitate other staff members.

How close you get is a matter of personal preference and practice. Some staff are happy to become very emotionally close to relatives and others are not. There is no right or wrong answer to this. You may find that you are able to judge or control how close you wish to get. Beware that the closer you get to the family, the more emotionally overcome you may be for periods while you are at work. It is also important to acknowledge that after a patient's death you may go through a period of grieving, if you have become particularly attached to the patient or family. This grieving is entirely normal, but is important to recognise the symptoms and signs as you go through it.

Documentation

You must ensure that you document all family meetings that you attend, in the patient's notes. The note should include details of the date & time the meeting was held, who was present (including family members and hospital staff), and a narrative overview of the issues discussed and any decisions that were reached.

If you encounter a situation of conflict or disagreement with the family, it is important that you convey this to the responsible Intensive Care Specialist so that this can be addressed further.

Summary

A helpful factor in helping discussions with family is trying hard to care for them. By doing so, you will want to provide the right information at the right time to allow them to be informed, particularly if this involves making a decision.

Sometimes it is necessary to be very frank in the initial discussions to position the family better for a subsequent discussion.

Caring for the family may involve sharing some emotion with them.

Appendix 2 - Timesheet Tips

ROSTERED DUTIES

SHORT DAY

This column is the rostered shift hours only

ORDINARY TIME				LEAVE		TOTAL		OVERTIME		CALLBACK		CALLBACK		CLAIMABLE ALLOWANCES		ALLOWANCES		AUTHORISED	
Day	Start	Finish	Start	Finish	Type	Hours	ORD. HOURS	Start	Finish	Start	Finish	Start	Finish	Type	Claim	Start	Finish	BY	GOST CODE/OVERRIDE
Mon																			
12	8:00	17:00					9												
Tues																			

LONG DAY

ORDINARY TIME				LEAVE		TOTAL		OVERTIME		CALLBACK		CALLBACK		CLAIMABLE ALLOWANCES		ALLOWANCES		AUTHORISED	
Day	Start	Finish	Start	Finish	Type	Hours	ORD. HOURS	Start	Finish	Start	Finish	Start	Finish	Type	Claim	Start	Finish	BY	GOST CODE/OVERRIDE
Mon																			
12	8:00	22:00					14												
Tues																			

EVENING

ORDINARY TIME				LEAVE		TOTAL		OVERTIME		CALLBACK		CALLBACK		CLAIMABLE ALLOWANCES		ALLOWANCES		AUTHORISED	
Day	Start	Finish	Start	Finish	Type	Hours	ORD. HOURS	Start	Finish	Start	Finish	Start	Finish	Type	Claim	Start	Finish	BY	GOST CODE/OVERRIDE
Mon																			
12	16:00	0:00					8												
Tues																			

NIGHT

ORDINARY TIME				LEAVE		TOTAL		OVERTIME		CALLBACK		CALLBACK		CLAIMABLE ALLOWANCES		ALLOWANCES		AUTHORISED	
Day	Start	Finish	Start	Finish	Type	Hours	ORD. HOURS	Start	Finish	Start	Finish	Start	Finish	Type	Claim	Start	Finish	BY	GOST CODE/OVERRIDE
Mon																			
12	21:00	9:00					12												
Tues																			

! ! PLEASE NOTE THAT THE TIMESHEET MUST RECORD **ACTUAL HOURS WORKED** TO THE NEAREST QUARTER HOUR.

If you work less than the rostered shift then you must show the reduced hours in the Total Ord. Hours Column.

If you work more than the rostered hours then refer below:

ROSTERED OFF

ORDINARY TIME				LEAVE		TOTAL		OVERTIME		CALLBACK		CALLBACK		CLAIMABLE ALLOWANCES		ALLOWANCES		AUTHORISED	
Day	Start	Finish	Start	Finish	Type	Hours	ORD. HOURS	Start	Finish	Start	Finish	Start	Finish	Type	Claim	Start	Finish	BY	GOST CODE/OVERRIDE
Mon																			
12	Rostered Off						----												
Tues																			

nb: Please note that if you are Rostered Off on a transferable Public Holiday you still show the day as nil hours.
You will be paid as usual for the fortnight but will be credited with an additional day on your " Leave in Lieu of Stat " balance.

ANNUAL / STUDY / SICK LEAVE

ORDINARY TIME				LEAVE		TOTAL		OVERTIME		CALLBACK		CALLBACK		CLAIMABLE ALLOWANCES		ALLOWANCES		AUTHORISED	
Day	Start	Finish	Start	Finish	Type	Hours	ORD. HOURS	Start	Finish	Start	Finish	Start	Finish	Type	Claim	Start	Finish	BY	GOST CODE/OVERRIDE
Mon																			
12	Annual Leave				ANL	8	-												
Tues																			
13	Study Leave				STUDY	8	-												
Wed																			
14	Ordinary Sick Leave <i>or</i> Domestic Sick Leave				SESK SDOM	8 8	-												

ADDITIONAL DUTY - Covering a full extra shift (to cover the absence of someone rostered on for the shift but not attending, excludes Short Days 1 & 2)

ORDINARY TIME				LEAVE		TOTAL		OVERTIME		CALLBACK		CALLBACK		CLAIMABLE ALLOWANCES		ALLOWANCES		AUTHORISED	
Day	Start	Finish	Start	Finish	Type	Hours	ORD. HOURS	Start	Finish	Start	Finish	Start	Finish	Type	Claim	Start	Finish	BY	GOST CODE/OVERRIDE
Mon																			
12														Additional Duty	14	8:00	22:00		
Tues																			

NO 8 HOUR BREAK

You may occasionally work shifts or call backs that mean you would not have had an 8 hour break before your next rostered shift.
If this situation occurs, you must take an 8 hour break by starting your next shift later than usual. The expectation is that an 8 hour break will always be taken.
Exception: in exceptional circumstances you may be required to attend at the normal rostered time on the instruction of a Consultant.

If a Consultant's instruction meant that you did not have an 8 hour break between normal rostered duties please indicate this clearly in the " Remarks / Notes " area at the bottom of your timesheet. You will also need to advise which Consultant approved the non-8 hour break.
Payment for this will be made in accordance with the RMOCEC clause 14.4 and will be paid out at the end of the month when applicable.

EXTRA HOURS WORKED AT THE START OR END OF YOUR ROSTERED SHIFT

" OVERTIME " - Extra time worked at the start or finish of a duty outside of the rostered hours is to be noted in the overtime column. It will not be paid and is recorded solely for inclusion in a Run Review if required. THIS DOES NOT APPLY TO ADDITIONAL DUTY OR CALLBACK

ORDINARY TIME				LEAVE		TOTAL		OVERTIME		CALLBACK		CALLBACK		CLAIMABLE ALLOWANCES		ALLOWANCES		AUTHORISED	
Day	Start	Finish	Start	Finish	Type	Hours	ORD. HOURS	Start	Finish	Start	Finish	Start	Finish	Type	Claim	Start	Finish	BY	GOST CODE/OVERRIDE
Mon																			
12	8:00	17:00					9	17:00	17:30										

ORIENTATION - Hours spent attending Orientation, when not rostered on-duty, will be paid at your **Normal Hourly Rate**.

Example of an orientation session

ORDINARY TIME					LEAVE		TOTAL	OVERTIME		CALLBACK		CALLBACK		CLAIMABLE ALLOWANCES		ALLOWANCES		AUTHORISED	
Day	Start	Finish	Start	Finish	Type	Hours		ORD. HOURS	Start	Finish	Start	Finish	Start	Finish	Type	Claim	Start	Finish	BY
	16:00	0:00	(evening)					8							Normal Hourly Rate	1.5	9:00	10:30	
	21:00	9:00	(night)					12							Normal Hourly Rate	1.5	9:00	10:30	
	Rostered Off						-								Normal Hourly Rate	1.5	9:00	10:30	

CALL BACKS TREATMENT										Appendix 1.	
	On Duty		Call Back		Call Back		Call Back		Additional Duty		Paid
1	8:00	17:00	19:00	19:30							Normal pay + 4 hrs
2	8:00	17:00	18:00	23:00							Normal pay + 5 hrs
3	8:00	17:00	17:30	18:00	19:00	19:30	21:00	23:00			Normal pay + (maximum) 8 hrs
4	8:00	17:00							17:00	19:00	Normal pay + 2
<p>A Call Back is paid as a minimum of 4 hours (eg 1) but the total Call Back payments cannot exceed 8 hours in an 8 hour period (eg 3).</p> <p>A single Call Back of greater than 4 hours is paid the literal number of hours worked (eg 2).</p> <p>Call Backs are only applicable if the RMO has left the premises. If the RMO's has done a rostered duty and is paged as On Call without leaving the premises this is treated as Additional Duties (as the duties are consecutive) if the duty extends for <u>three</u> hours or more (eg 4).</p> <p>If the duty is less than three hours it is unpaid and recorded in the " Overtime " column for inclusion should a Run Review be called for.</p> <p>The timesheet must show the name of the Duty Consultant or Duty Registrar who called you in, in the Authorised By column.</p> <p>A brief explanation would be appreciated. Eg. Retrieval Nelson</p>											

APPENDIX 3

(extracted from CCDHB Coroner's Policy Document ID: 1.788, 22 Dec 2015)

Procedures for Coroner's cases

Policy

The purpose of this policy is to enable:

- staff to be aware of deaths that must be reported to the Coroner
- staff to be aware of the correct procedures to be followed when notifying the Coroner
- the Chief Medical Officer (CMO) and Legal Services to be kept informed and coordinate pre-inquest responses to the Coroner
- reports provided by clinicians in response to a Coroner's request to be appropriate and timely
- all staff to be aware of their legal obligations.

Indications

Deaths that must be reported to the Coroner

The Coroner must be notified of some but not all inpatient deaths. The following deaths must be reported:

- Deaths where no doctor can reasonably issue a medical certificate of death because not enough is known about the cause of illness leading to death
- Death is due to trauma, suicide, unnatural or violent means and/or subsequent complications. This includes complications of falls and anaphylaxis and drug reactions
- Death that occurs during or after a medical, surgical or dental operation or treatment or procedure including recovery of consciousness from anaesthesia; or as a result of administration of an anaesthetic or medicine
- There is no time limitation
- This can include deaths that follow or are closely linked to an invasive medical procedure, e.g. cardiac catheterisation, elective cardioversion, pericardiocentesis, pacemakers ICD insertion, angiography, stenting, biopsies, central line insertion, pleural fluid drainage, pleurodesis, chest drain, bronchoscopy, paracentesis, urethral or suprapubic catheterisation, embolisations, endoscopy, ECT, joint infections (this list is not exhaustive)
- Death occurred while pregnant, or as a result of a woman giving birth
- Death occurred while a patient was institutionalised, imprisoned or in custody or under the control of a security officer (as defined under the Corrections Act 2004); or was institutionalised, imprisoned, in custody or under the control of a security officer prior to the hospitalisation

- Deaths on or from an aircraft registered in New Zealand, a New Zealand ship, an aircraft or ship of the Armed Forces
- The death of a child or young person while that child or young person is in the custody or care of the Chief Executive of the Children, Young Persons and Their Families Act, or other approved persons, residences or bodies as directed by the Chief Executive
- The death of a patient as definite under the Mental Health (Compulsory Assessment and Treatment) Act 1992
- The death of any proposed care recipient or care recipient as defined under the Intellectual Disability (Compulsory Care and Rehabilitation) Act 2003
- The death of a person in the custody of the New Zealand Police

Email: NIO@justice.govt.nz Fax: 09 969 6569 Phone: 0800 266 800	Office of the National Duty Coroner	HOSPITAL RECORD OF DEATH <i>(and, if required, Notification of Death to Coroner)</i>
--------------------------------------------------------------------------------------------	----------------------------------------------------	------------------------------------------------------------------------------------------------

(Complete Patient details or affix hospital label)

Name of Hospital:		Surname:			NHI No.:		
		First Names:			Ward:		
		Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female Age:			DOB:		
Date of death:			How long was the patient in hospital this admission?			Hours / Days / Mths	
Time of death:			How long was the patient in your care?			Hours / Days / Mths	
Transferred from:			Consultant/Registrar: (with whom you discussed this death)				
Patient underwent surgical or dental operation, or a medical procedure, or a procedure requiring anaesthesia, during this admission or prior to transfer?:						YES <input type="checkbox"/>	NO <input type="checkbox"/>
If YES, specify operation or procedure, and when:						Date:	
						Time:	

Account of this admission (Brief details only required)	Or – Discharge Summary attached: (Tick if applicable) <input type="checkbox"/>
Your opinion as to the cause of death: 1 a: Direct cause (Disease, injury or complication) 1 b: Due to (or as a consequence of)	

Circumstances of Death:		(Please answer all questions)	(TICK)	YES	NO	Unsure
Unknown cause, Self-inflicted, Unnatural, etc	Death was: without known cause / self-inflicted / unnatural / violent / patient admitted due to injury			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Medical procedure, Anaesthetic, Pregnancy, Childbirth	Death occurred during, or appears to be result of, medical procedure AND was medically unexpected			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Death occurred while person affected by anaesthetic AND was medically unexpected			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Death of woman occurred while she was giving birth, or appears result of her being pregnant or giving birth			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Official Custody / Care	Death occurred in official custody or care (including being subject to Mental Health legislation)			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No MCCD	Doctor has not given a MCCD (Certificate as defined in section 21(1) Burial and Cremation Act 1964)			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Family Concerns	A person is expressing concern as to cause of death or hospital treatment of the deceased			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If any of the above are ticked 'YES' or 'UNSURE' then the death <u>must</u> be reported to, or discussed with, the National Duty Coroner – if all ticked 'NO', you are <u>not</u> required to notify the Duty Coroner						
Medical Certificate	Doctor is prepared to issue a MCCD?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Police	If you are not signing a MCCD, have Police been notified?			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Note If the Duty Coroner accepts jurisdiction and a post-mortem is likely then the Clinical Notes MUST accompany the body to the mortuary						

Contact Details:	Cellphone:	Pager:	Fax:
Signature of Reporting Medical Practitioner:	Name:		Date and Time:

For Hospital use only	YES	NO	For Duty Coroner's Use only	YES	NO
Record of Death sent to Duty Coroner:	<input type="checkbox"/>	<input type="checkbox"/>	Discussed with reporting Doctor:	<input type="checkbox"/>	<input type="checkbox"/>
Discussed with Duty Coroner (name):			Or Doctor:		
Received back from Duty Coroner:	<input type="checkbox"/>	<input type="checkbox"/>	Jurisdiction Accepted:	<input type="checkbox"/>	<input type="checkbox"/>
Clinical team notified of response:	<input type="checkbox"/>	<input type="checkbox"/>	PM required:	<input type="checkbox"/>	<input type="checkbox"/>
GP Notified:	<input type="checkbox"/>	<input type="checkbox"/>	Doctor's report in-lieu of PM:	<input type="checkbox"/>	<input type="checkbox"/>
Family notified of death:	<input type="checkbox"/>	<input type="checkbox"/>	Coroner:	Date:	

Principles for Antibiotic Prescription

Treatment of infection

- time to initiation of treatment affects outcome
- adequate resuscitation
- surgical drainage of infected collections where indicated
- collection of infected, or suspected, material and blood cultures for microbiological and / or histological analysis:
 - blood: 2 sets at different times from venous stabs
 - urine
 - sputum
 - any other suspicious site
- rational prescription of empiric antibiotics
- prompt administration of appropriate antibiotics

Obtain as many cultures as possible before antibiotics commenced.

In sick patients “best guess” antibiotics should be commenced prior to results

When gram stain or culture results return, antibiotic cover should be rationalised to specific treatment for isolated organism.

Prophylaxis

a) proven indications:

- abdominal surgery which involves a breach of the colonic mucosa (traumatic or elective), or drainage of an infected cavity
- selected obstetrical and gynaecological procedures (cesarean section with ruptured foetal membranes, vaginal hysterectomy)
- insertion of a prosthetic device
- compound fractures
- amputation of gangrenous limb

b) unproven but recommended:

- *lacerations penetrating into periosteum or into joint cavities*
- *crush injuries*
- *insertion of neurosurgical shunt*
- *cardiac valve replacement*
- *arterial prosthesis*

The Infectious Diseases department of Capital & Coast DHB have produced an app called Empiric which contains the latest ID/Micro advice for the CCDHB region. It is free & highly recommended. For iPhones, it can be found here:
<https://itunes.apple.com/nz/app/empiric/id1390806194>



Disease Process	Organisms	Antibiotic
Pneumonia <u>community acquired</u>	Strep pneumoniae H influenzae Staph aureus Mycoplasma Legionella	Ceftriaxone 2 g once daily and Azithromycin 500 mg once daily Moxifloxacin 400 mg once daily when Penicillin anaphylaxis (adjust in renal impairment)
<u>hospital acquired / health care acquired</u> (> 48h after hospitalisation)	Often Strep, H infl, Staph aureus. Occ gram neg gut organisms. Need to cover resistant organisms.	Amoxycillin-Clavulanate 1.2g IV 18h Or Piperacillin-tazobactam 4.5g q6h if anti-pseudomonas cover required
Do not add Metronidazole for either pneumonia, even if the patient has aspirated		
Sepsis / Septic Shock (unidentified organism) <u>Community acquired</u> a) intraabdominal source		Cefuroxime 1.5 g q8h and Metronidazole 500 mg bd add Amoxicillin 1g q6h if suspected biliary source
b) urinary source	need to cover Klebsiella, Proteus	Cefuroxime 1.5g q8h OR Gentamicin
c) skin / soft tissue		Flucloxacillin 2g q6h If necrotising fasciitis or toxic shock syndrome: Clindamycin 600 mg q6h plus either: Limb infections: Flucloxacillin 2g q6h Groin or Abdomen: Piperacillin-Tazobactam 4.5g q6h
d) joint infection		Flucloxacillin 2g q6h
e) unknown source	Respiratory / Uro most likely source, also covers meningitis	Cefuroxime 1.5 g q8h

Disease Process	Organisms	Antibiotic
f) shocked infant, unknown source		Flucloxacillin 50mg/kg/dose (max 2g) q4-6h and Gentamicin daily.
g) neutropenic sepsis		Piperacillin-Tazobactam 4.5g q6h
<i>Hospital acquired</i>		Piperacillin-Tazobactam 4.5g q6h
Meningitis	Usually: Meningococcus Pneumococcus H. influenzae	Ceftriaxone 2 g q12h Add Amoxycillin 2g IV 14h if risk factors for Listeria (Pregnant, Age>60, Immunocompromised)
	Gram neg Diplococci	Penicillin 2.4 g (4 megaunits) q4h
	Gram pos Cocci	Ceftriaxone 2 g q12h and Vancomycin 500mg q6h
	Gram neg Bacilli	Ceftriaxone 2 g q12h
	not definitely bacterial	Consider Acyclovir 10 mg /kg q8h
Add Dexamethasone 10 mg q6h for 4 days (give 1st dose before antibiotics)		
Miscellaneous		
	Pseudomonas aeruginosa	Piperacillin-Tazobactam 4.5g q6h
Epiglottitis	H influenza	Cefuroxime 1.5 g q8h
	Coag neg Staph	Vancomycin 1 g q12h (see below)
Tetanus	Clostridium tetani	Metronidazole 500 mg q8h and Tetanus Ig
Herpes Encephalitis	Herpes simplex	Acyclovir 10 mg/kg q8h
Pneumocystis pneumonia	Pneumocystis carinii	Co-Trimoxazole 120mg/kg in 2-4 divided doses Comes as 480 mg vial/ tablet, 80 mg Trimethaprim + 400 mg Sulfamethoxazole. Round to multiples of 480. Prednisone 40 mg q12h
CD diarrhoea	Clostridium difficile	Metronidazole 400 mg orally q8h or 500 mg iv q8h

Fungal Infections	
Systemic Candida Infection	Fluconazole 400 mg iv daily
Other Systemic Fungus	Consult ID
Candida - oral - vaginal / perineal	Miconazole suspension Miconazole pessary daily plus local cream plus oral agent for all 5 days. Consider iv Fluconazole in severe cases

Prophylactic Antibiotics	
Compound Ortho Fractures	Cephazolin 1g q8h (for 3 doses only)
Compound Dental Fractures	Augmentin 1.2 g q8h
Elective Cardiothoracic Surgery	Cefazolin 2g on induction, repeat 4 hours later, 3 hours after ICU admission and 11 hours postop.
ICP Catheter Insertion	Cefazolin 2g (single dose)
EVD Drain	Cefazolin 2g (single dose)
Urgent chest drain insertion	Cefazolin 2g (single dose)

Antibiotic / Antifungal Guidelines

Drug	Adult	Child (mg/kg/day)	Renal Impairment GFR (ml/min)	Renal Replacement Therapy
Aciclovir	10mg/kg iv 8 hourly (watch in renal failure)		25-50 5-10 mg/kg q12h 10-25 5-10 mg/kg daily <10 2.5 - 5 mg/kg daily	CAPD: not dialysed. Dose as in GFR < 10 HD: dialysed. Dose as in GFR < 10 CAV/VVHD: dialysed. Dose as in GFR 10 - 25
Amoxicillin	1g q8h	100-200	10-50 dose as in normal renal function <10 250 mg q8h	CAPD / HD: dialysed. Dose as in GFR < 10 CAV/VVHD: dialysed. Dose as in normal renal function
Augmentin	1.2 g q8h	60-120	30-50 dose as in normal renal function 10-30 1.2g q12h <10 1.2g stat, then 0.6-1.2g q12h	CAPD / HD: dialysed. Dose as in GFR < 10 CAV/VVHD: dialysed. Dose as in GFR 10-20
Caspofungin	70 mg loading dose on day1, then 50 mg daily. 70 mg/kg/d if BW > 80kg		Dose as in normal renal function	Not dialysed. Dose as in normal renal function

APPENDIX 4 Antibiotics for Intensive Care

Drug	Adult	Child (mg/kg/ day)	Renal Impairment GFR (ml/min)	Renal Replacement Therapy
Cefazolin	1 g q8h		10-50 1-2 g q12h <10 1-2g q 24-48h	HD: 2g after each HD
Cefipime	1 g q12h		10-50 dose as in normal renal function <10 0.5 - 1g q8-12h	CAPD: dialysed. Dose as in GFR < 10 HD: dialysed. Dose as in GFR < 10 CAV/VVHD: not dialysed. 1g q12 h
Cefotaxime	1-2 g q8-12h	100-150	10-50 dose as in normal renal function <10 0.5-1g q8-12h	CAPD/HD: dialysed. Dose as in GFR ≤ 10 CAV/VVHD: not dialysed. 1g q12h
Ceftazidime	1-2 g q8-12h		31-50 1g q12h 16-30 1 g q24h 6-15 0.5 g q24h <5 0.5 g q48h	CAPD: dialysed 0.5-1g q24h HD: dialysed. 0.5-1g q24-48h CAV/VVHD: not dialysed. 0.5-1g q12h
Ceftriaxone	1 g q24h (severe infections, meningitis, endocarditis: 2-4g daily)	20 - 50	Dose as in normal renal function	Not dialysed. Dose as in normal renal function.
Cefuroxime	1.5 g q8h	100	20-50 750 mg - 1.5 g q8h 10-20 750 mg - 1.5 g q8-12h <10 750 mg - 1.5 g q24h	CAPD: unknown dialysability. Dose as in GFR <10 HD: dialysed. Dose as in GFR <10 CVA/VVHD: unknown Dose as in GFR 10-20
Ciprofloxacin	100 - 400 mg q12 h		20-50 Dose as in normal renal function <20 50% of normal dose	CAPD: not dialysed 100 mg q12h HD: not dialysed. 100-200mg q12h CVA/VVHD: dialysed 200-400mg q12h
Clindamycin	600 mg q12h		Dose as in normal renal function	Not dialysed. Dose as in normal renal function.
Erythromycin	1 g q6h	30 -50	10-50 Dose as in normal renal function <10 50-75% of normal dose, max 1.5 g daily	CAPD: removal unlikely Dose as in GFR <10 HD: not dialysed. Dose as in GFR <10 CVA/VVHD: unknown Dose as in normal renal function
Flucloxacillin	1-2 g q6h	50-100	10-50 Dose as in normal renal function <10 Dose as in normal renal function, up to 4g/day	CAPD/HD: not dialysed Dose as in GFR <10 CVA/VVHD: not dialysed Dose as in normal renal function

APPENDIX 4 Antibiotics for Intensive Care

Drug	Adult	Child (mg/kg/ day)	Renal Impairment GFR (ml/min)	Renal Replacement Therapy
Fluconazole	400 mg load, 400 mg daily		10-50 Dose as in normal renal function <10 50% of normal dose	CAPD: dialysed Dose as in GFR <10 HD: not dialysed. Dose as in GFR <10 Give post dialysis CVA/VVHD: dialysed Dose as in normal renal function
Gentamycin	7 mg/kg/d, single dose (see appendix for dosing and levels)			
Imipenem	500 mg q6h		31-70 0.5-1g q8h 21-30 0.5-1g q12h <20 250 mg (or 3.5mg/kg whichever is lower) q12h	CAPD/HD: dialysed. Dose as in GFR <20 CAV/VVHD: dialysed. Dose as in GFR 21-30
Meropenem	0.5 - 1 g q8h		25-50 1g q12h 10-25 500mg q8h <10 500mg q24h	CAPD/HD: dialysed. Dose as in GFR ≤ 10 CAV/VVHD: dialysed. Dose as in GFR 10-20
Metronidazole	iv: 500 mg q12h suppository: 1 g q12h po: 400 mg q12h	15	10-50 Dose as in normal renal function <10 normal dose Q12h	CAPD: not dialysed Dose as in GFR <10 HD: dialysed. Dose as in normal renal function CVA/VVHD: unknown Dose as in normal renal function
Penicillin G	0.6g - 14.4g daily in 2-4 divided doses	50 - 250	10-20 75% of normal dose <10 20-50% of normal dose. Max 6 MU/day in ESRF	CAPD/HD: dialysed. Dose as in GFR ≤ 10 CAV/VVHD: dialysed. Dose as in GFR 10-20
Rifampicin	600-1200 mg daily	20	10-50 Dose as in normal renal function <10 50-100% of normal dose	CAPD/HD: not dialysed Dose as in GFR <10 CAV/VVHD: unknown Dose as in normal renal function
Roxithromycin	600 mg po / ng daily			
Tazocin	4.5 g q6h		20-50 Dose as in normal renal function < 20 4.5 g q12h	CAPD / HD: dialysed Dose as for GFR ≤ 10 CAV/VVHD: dialysed. dose as for GFR 10-20
Vancomycin	1 g q12h (6 hourly for meningitis) (see also appendix for dosing)	20 - 40	20-50 500 mg q12-24h 10-20 500mg q24-48h <10 500mg q48-96h	CAPD/HD: not dialysed Dose as in GFR <10 CAV/VVHD: unknown Dose as in GR 10-20

Specific dosing regimens and therapeutic levels

Gentamicin

Concentration-dependent killing → peak : MIC > 8 - 10

Toxicity: Nephrotoxicity. Ototoxicity. Increased incidence with consistent levels:

Peak > 12-14 mg/L or

Trough > 2 mg/L

Dosing: All dosing is by Lean Body Weight. Dose: 7 mg/kg/d in single dose
(adjust to nearest 40 mg)

Lean Body weight:

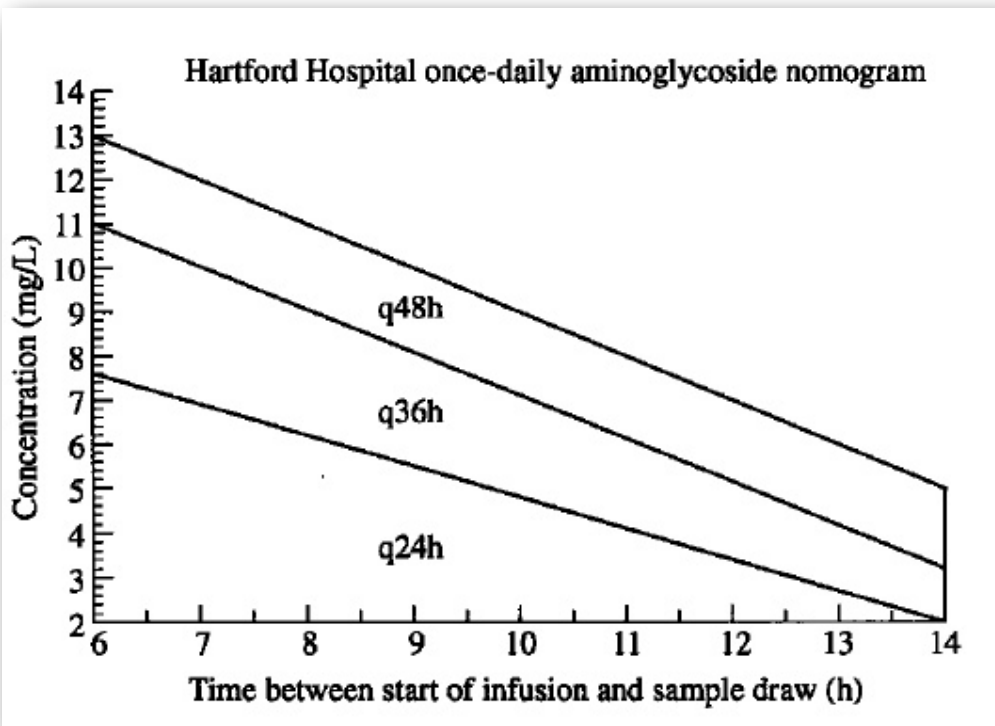
male: $50\text{kg} + 0.9\text{kg/cm height} > 150\text{ cm}$ female: $45\text{kg} + 0.9\text{kg/cm height} > 150\text{ cm}$

Levels:

Obtain a single random blood sample between 6 and 14 h after the start of an aminoglycoside infusion (over 1 hour).

This single concentration will be evaluated on the nomogram for once-daily drug administration (see nomogram).

- If the level falls in the area designated q24h, the dosing interval is q24h (the same applies for the areas of q36h and q48h).
- If the point is near the line, the longer interval is chosen to avoid drug accumulation and provide a sufficient drug-free period.
- If the random drug concentration in serum is off (i.e., above) the nomogram between the 6- and 14-h time points, the scheduled therapy is stopped and the drug concentration in serum is monitored to determine the appropriate time for administration of the next dose (i.e. concentration of 1 mg/l).
- Although determination of even a single random concentration may no longer be necessary for many patients, it will be necessary to obtain several samples for patients with changing CLCRs or those whose CLCRs are significantly reduced.
- When ODA therapy is continued for > 5 days, random drug concentrations in serum should be determined weekly to monitor therapy.



Hartford Hospital once-daily aminoglycoside programme.

Initial dosing regimen—Determine the patient's creatinine clearance

Creatinine clearance (mL/min)	Dose and interval
≥60	7 mg/kg every 24 h
60–40	7 mg/kg every 36 h
40–20	7 mg/kg every 48 h
<20	7 mg/kg, then follow serial levels to determine time of next dose (level <1)

Exclusion of ODA: Paediatrics, pregnancy, burns (20%), ascites, dialysis, enterococcal endocarditis.

Vancomycin

Time-dependent killing → max 24h-AUC:MIC ratio

Toxicity: Ototoxicity. Nephrotoxicity. Red-man-syndrome ∝ Peak serum levels.

Dosing: Initial dose 1g iv over 1 hour in all patients.

Morbidly obese: 30 mg/kg/d based on actual body weight; they might require a more frequent dosing interval due to faster clearance.

Subsequent dosing guided by creatinine clearance: (or as per level)

CrCl 20 - 50 ml/min - 500 mg iv q12-24h

CrCl 10 - 20 ml/min - 500 mg iv q24-48h

CrCl < 10 ml/min - 500 mg q48-96h

CAPD/HD: not dialysed. Dose as in GFR ≤ 10

CAV/VVH: unknown dialysability. Dose as in GFR 10-20 ml/min

Cockcroft-Gault Equation:

$$\text{Creatinine Clearance ml/min} = \frac{(140 - \text{age}) \times \text{weight (kg)}}{815 \times \text{serum creatinine (mmol/l)}}$$

Levels: Target trough level: 10-20 mg/L (1h before next dose)

Check first trough level

a) stable renal function: 1hr pre-dose on day 3 (steady-state),
then every 3 days thereafter

b) unstable or CrCl <10ml/min: levels at 24h intervals.

When level <10 mg/l give another 1g dose

Please read the vancomycin nomogram in the Wellington ICU Drug Manual which is available on every computer desktop in the ICU, in a book in the unit, and online as a PDF here: <https://drug.wellingtonicu.com>

APPENDIX 5**Cardiac Surgical Management in Intensive Care****On Admission:**

Take handover from cardiac anaesthetist and cardiothoracic registrar.

Important information on handover:

- Elective vs in-hospital vs emergency surgery
- Preop functional state & left ventricular function pre-operatively
- Renal function, previous medical history
- Type of surgery, which surgeon
- Anaesthetic complications (intubation, lines)
- Surgical complications (any difficulties with grafts, valves or cannulation, bleeding)
- Bypass information (cross-clamp & bypass time, problems coming off bypass)
- Transfusions, thromboelastogram (TEG) results
- Intraoperative transoesophageal echo(systolic/diastolic function, valves, right ventricle)
- Pacing leads (what kind, tested and working, paced, underlying rhythm)
- Intra-aortic balloon pump (surgical vs percutaneous placement, trigger, timing) if present

Ventilation:

Unless otherwise suggested by anaesthetist:

- Initial mode=ASV, FiO₂ 0.5, PEEP 5cmH₂O, MV 100%
- Check chest ventilating bilaterally
- Chart ABG parameters e.g. PaO₂ > 60, SaO₂ 90-95%

Haemodynamic Parameters

- Chart MAP, CVP, mPAP (if PA catheter in-situ)
- Chart current vasoactive infusions
- Consider:
 - Volume challenge - may need multiple fluid boluses
 - Change Phenylephrine to Noradrenaline if escalating doses - check ScvO₂ (or SvO₂ if PAC present)
 - Adding Milrinone if poor cardiac function (discuss with consultant/SR)
 - Pacing if rate < 70/min in a synchronised mode
 - PA catheter
 - Contact surgical team
 - Cardiac tamponade - is an urgent TOE required?
 - Intra-aortic balloon pump

Fluids:

For hypovolaemia:

- 0.9% NaCl or Plasmalyte 500ml bolus, *repeat if effective*
- Red cells if Hb <70 g/L (< 80g/l if bleeding)

Drug Chart:

Please use the preprinted cardiac drug chart for the post-operative cardiac surgical patient ONLY.

Ensure there are no contraindications for the charted meds.

Fill in the appropriate doses and sign EACH DRUG SEPARATELY.

Ensure there are no duplications with pre-existing drug charts.

Aspirin:

100 mg (enteric coated) stat as soon as possible post-extubation

100 mg (enteric coated) po mane for all CABG patients (or 150mg non-enteric coated if administered via nasogastric tube)

Atorvastatin:

40 mg po mane for CABG

(or chart patient's 'normal' statin at pre-op dose)

DVT prophylaxis:

Enoxaparin 40 mg sc nocte from day 1 post operation (if not bleeding), 20 mg if renal impairment

Antihypertensives:

Do not restart pre-op antihypertensives initially

Metoprolol will be re-introduced at small dose once patient off inotropes, stable and not bradycardic (if no other contra-indications)

Warfarin:

For valves check requirement (all mechanical valves life-long. Tissue valves may get Warfarin for 3 months, mainly for MVR but this varies by surgeon)

Post-op Day 1 Warfarin 3mg po nocte or consider Heparin infusion/Clexane

The loading regimen is 3/3/3 over 3 consecutive days unless INR otherwise elevated.

Cefazolin:

Chart single dose on once only section: 2g to be given 8 hours after last intra-operative dose.

Chart Potassium Chloride (KCl) in prn section (via CVL, ICU only).

If K < 4.5 give 10 mmol KCL

If K < 4.0 give 20 mmol KCL

Gastric ulcer prophylaxis:

Omeprazole 40mg daily for high risk e.g. ulcer history, prolonged ventilation

Analgesia/Antiemetic:

Paracetamol 1g 6 hourly po/ng/iv

Tramadol 50-100mg prn 6 hourly (po or iv)

PCA *Morphine* as standard, consider *Fentanyl* if allergy or renal impairment

Generally avoid NSAID given the typical patient population group (elderly, diabetic, bypass- induced renal injury etc)

Ondansetron, Metoclopramide, Cyclizine

Sedation:

Chart *Propofol* infusion

Inotropes/Vasoactives:

Noradrenaline premix (10mg in 100ml) charted at 0-20mls/hr

Other vasoactives (discuss with consultant):

Adrenaline (10mg in 100ml) charted at 0-20mls/hr

Milrinone (10mg in 50ml), usually 0-10ml/hr

Vasopressin (20u in 20ml) at 0-3ml/hr

Dopamine (100mg in 50ml) at 0-10ml/hr

Levosimendan is by ICU specialist request only & is not used routinely

Significant Bleeding:

Contact surgical team **early** if concerned

Follow TEG guided Transfusion Protocol (see attached)

Order CXR – and review (ETT and CVL position, pleural effusion, pneumothorax, IABP, PAC etc.)

New onset AF:

Check electrolytes

Correct $Mg^{2+} > 1.0$

Amiodarone 300mg over 1 hours, then 900mg over 24 hours

DCCV if severely compromised (rare)

Digoxin 500mcg, then 500mcg 6 hours later if required

Hypertension:

GTN infusion

Resume pre-op antihypertensives

Intra-aortic Balloon Pump:

Check position on CXR - radio-opaque tip should be just below aortic arch. Feel for left radial pulse and pedal pulses, check insertion site, check adequate triggering and timing.

Traumatic Brain Injury

Initial Management

The approach to management is in accordance with the principles of EMST/ATLS with a primary survey and immediate treatment of life-threatening injuries followed by a secondary survey from head to toe to systematically evaluate injuries followed by definitive treatment.

General Statements

All patients admitted to Intensive Care following trauma with an altered level of consciousness (GCS < 15) should have a head and C-spine CT scan.

In all patient admitted with a GCS < 15 assume a cervical spine injury unless proven otherwise. Plain films do not have a role. If the C-spine CT formal report is normal, the neck can be considered cleared unless there was history of neurological deficit prior to intubation in which case an MRI should be considered to exclude ligamentous injury.

Patients who have sustained significant trauma with a GCS <14 should have a trauma whole-body CT (WBCT - Non-contrast scan of the head + C-spine, followed by split bolus contrast enhanced CT of the chest, abdomen and pelvis). See the hospital trauma imaging guideline for further details.

General Care of Patients with Severe Head Injury

General principles:

- Prevention of secondary injury
- Maintenance of cerebral perfusion and oxygenation
- Control of ICP (minimising cerebral swelling and control extracranial factors)

Airway and breathing

Criteria for endotracheal intubation:

Patients with GCS ≤ 10 must be intubated early. Some patients with GCS > 10 may require intubation and ventilated to protect and maintain airway or to control ventilation. Remember to protect the C-spine (in-line stabilisation) and prevent aspiration (RSI).

Ventilatory goals:

Keep Sats > 95%, PaCO₂ 35 - 40 mmHg. Use 5 cm PEEP routinely as you would with any other patient. Do not reduce PEEP below this level in the belief it will reduce ICP.

Circulation

Circulatory goals:

Cerebral perfusion pressure is very important. In the absence of ICP monitoring maintain MAP > 80 mmHg using crystalloid and/or Noradrenaline (see below), if the patient has a GCS of ≤ 8.

If ICP monitoring is being used then maintain MAP to keep a Cerebral Perfusion Pressure (CPP) 60-70mmHg.

$\text{CPP} = \text{MAP} - \text{ICP}$

How to achieve these goals:

Hypotension is usually not due to brain injury itself. Exclude and treat other injuries (haemorrhage, spinal cord injury, cardiac tamponade/contusion, tension pneumothorax).

Fluids:

Euvolaemia must be established if the patient is hypotensive. Use crystalloid as the preferred resuscitation fluid and blood/products if indicated. (Do not use Albumin in traumatic brain injury patients as it has been shown to potentially worsen outcome). The usual transfusion threshold in ICU is Hb 70 g/L. If the patient has intracranial hypertension or is having CPP directed therapy the transfusion threshold is 80 g/L.

Inotropes:

Noradrenaline (NA) is most commonly used. It is predominantly alpha agonistic, hence very good at increasing MAP with little tendency to produce tachycardia and polyuria. Use only after the patient is volume replete and CPP targets are not yet achieved.

Monitoring:

Arterial line and central line

Position

Position the patient 15-30 degrees head up with the head in line with the trunk (ie not turned). Avoid venous obstruction at neck.

Consider supine position if the patient is in shock and if this would improve CPP.

Sedation / Paralysis

Sedate the patient generously with Propofol +/- Morphine and Midazolam to control ICP.

Do not routinely paralyse (see below).

Fluid management

Give adequate fluid to maintain cerebral and renal perfusion.

Avoid hyponatraemia; avoid giving lots of free water as 5% dextrose or enteral feed. Serum Na⁺ target 140 - 150 mmol/L.

Start with 0.9% saline or Plasmalyte at 50-100 ml/hr and adjust according to clinical requirements.

Inappropriate ADH secretion:

is common and presents as a **falling** Na⁺ and osmolality, with a low, normal or high urine output and commonly a high urine osmolality (> 400mosm/l). This is not a salt deficiency but a water excess.

Treat initially by fluid restriction (0 – 40 mls/hour) and then with concentrated 23.4% NaCl. Use in 20ml amounts, each over 60 min.

Prolonged SIADH may occur with very low urine outputs of 10 - 20mls/hr. Do not “treat” this if the patient is well perfused with good MAP, normal renal function and acid base measures. The patient’s glomerular filtration and creatinine clearance are normal but they have a very high distal tubular water reabsorption.

Hypertonic NaCl:

You can calculate the amount to give as follows, if you wish:

$$\boxed{4\text{ml/kg of } x\% \text{ saline raises serum sodium by } x\text{mmol/l}}$$

or

$$\boxed{\text{Mmol of Saline} = \text{body wgt} \times 0.4 \times \text{no of mmol to raise Na}^+}$$

To raise Na^+ by 5 (140 → 145) use $70 \times 0.4 \times 5 = 140\text{mmol} = 40\text{ml } 20\% \text{ strong salt.}$

Diabetes insipidus:

is uncommon but occurs with brain ischaemia. It presents as large volume urine outputs and a **rising** Na^+ or osmolality. Large urine outputs are common in patients who have received large volumes of fluid and who are made hypertensive but this is not DI.

To distinguish DI you must document a rapidly rising Na^+ eg 150, 155, 160, and serum/urine osmolarities.

DDAVP:

NEVER ADMINISTER DDAVP TO A PATIENT WITHOUT FIRST DISCUSSING IT WITH THE ICU or NEUROSURGICAL SPECIALIST.

1. Patients with raised intracranial pressure may be very sensitive to decreases in serum osmolarity - this makes DDAVP a very dangerous drug in this group of patients. It should only be used with due consideration of the risks and benefits.
2. Pre-emptive DDAVP is appropriate if a patient has had active therapy withdrawn and is coning (in this circumstance it is appropriate to use DDAVP to prevent the onset of severe hypernatraemia that would preclude brain death testing)
3. If DDAVP is used to treat, then the appropriate dose is 1-2mcg only (not more than this). You are treating the Na^+ not the urine output. You may need to measure the Na^+ every two hours to monitor what you do. Discuss with the ICU specialist.

Temperature

Avoid hyperthermia. Actively cool if temperature $> 38^{\circ}\text{C}$.

If ICP becomes too high (see below), consider lowering the patient’s core temperature to $36\text{-}37^{\circ}\text{C}$.

Anticonvulsants

No routine seizure prophylaxis.

Stop any fitting with Propofol or Benzodiazepines.

Patients will be loaded with Phenytoin after their first generalised seizure (with the exception of “immediate” seizures occurring at the scene). Phenytoin may also be prescribed prophylactically in high risk patients at the discretion of the neurosurgeon.

Load Phenytoin 20mg/kg over 30 minutes, then 5 mg/kg/day. Measure levels if concerns about seizure control or toxicity.

Therapeutic level: 40 - 80 μ mol/L.

Glycaemic control

Maintain BGL 6-10 mmol/L (avoid both hyperglycaemia and hypoglycaemia).

Venous thrombo-embolism prophylaxis

- All patients in ICU should receive mechanical DVT prophylaxis (sequential compression devices).
- No patient with a ventriculostomy tube in situ should receive chemical DVT prophylaxis.
- All patients with head injury or subarachnoid haemorrhage (except those with EVDs) will commence chemical DVT prophylaxis at 72 hours after ICU admission provided that there is no evidence of dynamic changes on a CT head at that time and no neurosurgical intervention is planned. If DVT prophylaxis is not commenced this decision will be reviewed and documented by the neurosurgeon daily.
- The preferred chemical DVT prophylaxis is enoxaparin 40 mg sc daily (at night); or 20 mg sc daily if the patient has renal impairment.
- If ICP monitors are to be removed, they should be removed at least 14 hours after the most recent dose of enoxaparin. The next dose of enoxaparin should not be given for at least 2 hours.
- If DVT prophylaxis is not administered then surveillance ultrasound of the lower limbs should be performed every 72 hours.
- Consider an IVC filter if a DVT is present on surveillance ultrasound.

Nutritional support

Aim to commence enteral nutrition within 24h and achieve full nutrition within 72h.

Stress ulcer prophylaxis

As for all other critically ill patients.

Antibiotic prophylaxis

- No antibiotics (except in theatre) are to be administered for patients with EVDs.
- No antibiotics are to be administered for compound skull fractures (including base of skull fractures) unless the wound was contaminated.
- No CSF specimens need to be sent from EVDs until they have been in for 5 days; thereafter, they will be measured daily (CSF specimens may be indicated earlier - for example if the patient is febrile).

Special Monitoring

CT head

CT scans will usually be repeated after 24 hours unless ICP monitoring has shown the ICP to be low and there are no significant focal lesions on the initial CT.

Subsequent scans may be needed for episodes of raised ICP or to monitor haematoma size.

ICP monitoring

Indications for ICP monitoring:

- All patients with a GCS ≤ 9 .
- Head Injury and ventilated/sedated and CT evidence of raised ICP.

Also consider for ICP monitoring:

- Patient is ventilated and sedated and considered at risk of developing raised ICP (high energy injury, age > 40, motor posturing, CT evidence of diffuse vascular injury, period of prolonged hypoxia or hypotension)
- Patients with a head injury, a normal CT head scan and who are not considered to be at particularly high risk of developing raised ICP but who are ventilated/sedated because of other injuries and will be inaccessible to clinical examination for some time.

ICP monitors will be inserted by the neurosurgeons or their registrar.

Neurophysiology

Some patients with severe head injuries requiring ICP monitoring will have sensory evoked potentials (SEPs) measured on day 1 or 2. This is usually if we suspect a severe diffuse axonal injury.

Call neurophysiology technician: ext. 80183 Fax 80072

Specific Management of Raised ICP

Threshold for intervention is 20 mmHg (in adults) unless otherwise specified by the neurosurgeon.

If ICP rises above the treatment threshold for more than five minutes, quickly check the following:

1. Optimise blood flow to and from the brain:

- check ventilation: PaO₂, PaCO₂, airway pressures (correcting the CO₂ can improve things rapidly and effectively!)
- exclude venous obstructions (head position/ tube tie, CVP, PEEP)
- defend CPP 60 mmHg

2. Reduce brain metabolic rate:

- adequate sedation/analgesia? (Opioids, Benzodiazepines, Propofol)
- Barbiturate loading (see below)
- normothermia 36-37°C.
- avoid hyperglycaemia, fever, seizures

3. Decrease brain cell volume and /or blood volume:

- aim for max. Na⁺ 150-155, Osm 290-310 with hypertonic saline (20ml of 23.4% NaCl administered slowly via CVL)
- Alternative option is 0.25 g/kg Mannitol (do not give if hypovolaemic)

4. Reduce CSF volume:

- External Ventricular Drainage (EVD)

5. Give the brain more room:

- Following publication of the DECRA trial, decompressive craniectomy is no longer recommended for patients with severe intractable intracranial hypertension

Consider repeat CT scan

Several options exist for managing raised ICP - the strategy for each patient should be discussed with the neurosurgeon and ICU specialist.

EVD

This may be inserted if hydrocephalus exists or may be used to drain normal ventricles to manage ICP. It will be inserted in theatre and the drain will be set at a specified level and left on continuous drainage.

The neurosurgical staff should be contacted if there is no (zero) fluid drainage over several hours (drain may be blocked) or there is excessive drainage > 40mls/hr (level set too low). A CSF sample will be sent for analysis daily.

The EVD will not be used to monitor ICP where possible. This will be done with the Codman monitor.

Routine antibiotic prophylaxis is not required for EVDs other than a single dose on insertion.

Removal of the EVD is the responsibility of the neurosurgical team.

Barbiturate Coma / Thiopentone:

This is an option for refractory intracranial hypertension, but not routinely used here.

Paralysis:

Do not routinely paralyse but use for coughing and straining if ICP is difficult to control. Give as intermittent boluses of atracurium (unless contraindicated). Use neuromuscular monitoring - aim for Train Of Four of 2/4 twitches. Paralysis may mask seizures.

ICP control Management guidelines (From the ANZICS EPO-TBI trial protocol)



ICP > 20 mmHg

ICP > 20 mmHg
Drain CSF if EVD present

ICP > 20 mmHg
Consider hypertonic saline or mannitol bolus

ICP > 20 mmHg
Reconsider EVD if not in place
Consider repeat CT brain scan

ICP > 20 mmHg
Consider cooling to 35°C

ICP > 20 mmHg
Consider thiopentone coma

Contact the ICU Specialist and/or Neurosurgeon if you are having difficulty controlling a patient's ICP.

Waking up

General management with tight control of CPP, osmolality, sedation and ventilation may be stopped when the patient's ICP has remained normal for 24 hours and no further swelling/oedema is expected.

ICP monitoring should continue when the patient's sedation is stopped to assess any changes in ICP that "waking" may produce.

Withdrawing Treatment

Any decision to withdraw treatment will be made by joint discussion with neurosurgical and intensive care specialists after taking into consideration the patient's age, prior health, injury and presentation, initial and subsequent CTs, SEPs, ICP, operative result and clinical examinations.

Patients with bilaterally absent median nerve SEP responses are extremely likely to be vegetative or become brain dead. Consideration will be given to stopping all sedation and allowing a clinical evaluation to confirm the poor prognosis.

Neurosurgical Management – Subarachnoid Haemorrhage

Grading

WFNS

Grade	GCS	Motor deficit
I	15	none
II	13 - 14	none
III	13 - 14	present
IV	7 - 12	none / present
V	3 - 6	none / present

Modified Fisher Scale (predicts vasospasm - worse with higher grade)

Grade	Haemorrhage appearance (CT)
I	Focal or diffuse, thin SAH (< 1mm), no IVH
II	Focal or diffuse, thin SAH, with IVH
III	Focal or diffuse, thick SAH (>1mm), no IVH
IV	Focal or diffuse, thick SAH, with IVH

Hunt and Hess (Prognosis worse with higher grade) - rarely used now

Grade	Symptoms
I	Asymptomatic, mild headaches, slight nuchal rigidity
II	Moderate - severe headache, nuchal rigidity, no neurological deficit other than cranial nerve palsy
III	Drowsiness / confusion, mild focal neurological deficit
IV	Stupor, moderate - severe hemiparesis
V	Coma, decerebrate posturing, moribund appearance

Management

Before aneurysm controlled (unclipped/uncoiled aneurysm):

Haemodynamic targets:

minimum MAP:

- initially >60
- may ask for >70 if age >75, oliguria, renal impairment

maximum systolic:

- aneurysmal SAH - attempt to keep sys <140
- prepontine - accept <160

antihypertensive agent

- initially increase nimodipine
- may need to add ACEI/B-blockers
- third line doxazosin

Timing of intervention:

Generally aim for early intervention in those patients with low grade

Vasospasm with unsecured aneurysm:

This is a complicated situation requiring discussion between Neurosurgeon and Intensivist.

After aneurysm controlled (Coiled or Clipped):

Haemodynamic targets:

Minimum MAP: >70

Fluids:

Which fluid is used is not important. How much fluid is used, is important.

Hyponatraemia is managed by water restriction not saline administration.

Vasospasm Management

Prevention

Calcium Channel Blockers - Nimodipine:

Generally start as soon as practicable following diagnosis of SAH.

Administration:

Nimodipine 60mg NG 4 hourly or

i.v. preparation given at 5-10ml/hr (1-2mg) with 1:4 co-infusion. MOH policy requires 'fluid'; either N/S or D5W acceptable. This is because of the irritant alcohol Nimodipine is dissolved in.

- IV Nimodipine should not be used unless the patient is not absorbing feeds; if IV Nimodipine is used, it should be changed to oral/nasogastric as soon as feed is tolerated.

- **Nimodipine should be withheld if the patient is on Noradrenaline - do not give both together;** if Nimodipine causes significant hypotension, a reduced oral/nasogastric dose of 30 mg may be trialled.

Treatment

"HHH therapy"

Hypertension:

Attempt to increase MAP following onset of neurological change and observe for an improvement.

If any improvement, maintain increased MAP (likely 90-110) until deficit resolved and stable for >48 hrs when may cautiously reduce.

If no improvement with MAP increasing by 10-20 mmHg after 2-4 hrs consider interventional radiography.

Noradrenaline is the preferred agent (after adequate volume restoration). Unless otherwise specified the ceiling level of Noradrenaline of patients being treated for vasospasm will be 20 ml/hr.

Do not give nimodipine if the patient is on Noradrenaline; if Nimodipine causes significant hypotension, a reduced oral dose of 30 mg may be trialled.

Hypervolaemia:

Aim to maintain euvolaemia or mild hypervolaemia rather than ongoing aggressive volume regimens.

Haemodilution:

General trend to accepting lower Hb levels of 80-100 has largely obviated need to target decreased PCV for rheostatic benefit.

Complications

Re-Bleeding

Hydrocephalus

Vasospasm / infarction

Delayed neurological deficit (metabolic, cardiovascular, infections, neuro)

Intraparenchymal haemorrhage

Meningitis

Seizures

Pulmonary complications: aspiration pneumonia, neurogenic pulmonary oedema

Electrolyte imbalance: SIADH, CSWS, Triple H therapy

Hyperglycaemia

ECG changes

Other Issues

EVD management:

ICU preference is for a separate ICP monitor and EVD if ICP monitor already present, rather than removing the ICP monitor and transducing the EVD.

DVT prophylaxis:

- All patients in ICU should receive mechanical DVT prophylaxis (compression stockings/ sequential compression devices).
- No patient with a ventriculostomy tube in situ should receive chemical DVT prophylaxis.
- All patients with head injury or subarachnoid haemorrhage (except those with EVDs) will commence chemical DVT prophylaxis at 72 hours after ICU admission provided that there is no evidence of dynamic changes on a CT head at that time and no neurosurgical intervention is planned. If DVT prophylaxis is not commenced this decision will be reviewed and documented by the neurosurgeon daily.
- The preferred chemical DVT prophylaxis is Clexane 40 mg sc daily (at night); or 20 mg sc daily if the patient has renal impairment.
- If ICP monitors are to be removed, they should be removed at least 14 hours after the most recent dose of Clexane. The next dose of Clexane should not be given for at least 2 hours.
- Consider an IVC filter if a DVT is present on surveillance ultrasound.

Antibiotic prophylaxis:

- No antibiotics (except in theatre) are to be administered for patients with EVDs.
- No antibiotics are to be administered for compound skull fractures (including base of skull fractures) unless the wound was contaminated.
- No CSF specimens need to be sent from EVDs until they have been in for 5 days; thereafter, they will be measured daily (CSF specimens may be indicated earlier - for example if the patient is febrile).

EARLY MANAGEMENT OF TRAUMA

ACKNOWLEDGEMENTS

This chapter is based heavily on the material taught in the Royal Australasian College of Surgeons “Early Management of Severe Trauma” Course.

Completion of this course is suggested for all registrars working in ICU.

It is recommended that trainees attend this course early on in their training to get the full benefit of the material in their day to day work. Application can be made via <http://www.surgeons.org>

INTRODUCTION

This manual outlines the early management of patients presenting with severe trauma to the Wellington Hospital.

All patients with severe trauma should be met on arrival, and will be initially assessed and resuscitated by the **Trauma Team**.

DEFINITION

Severe Trauma is traumatic injury causing abnormal breathing and/or shock and/or decreased level of consciousness (LOC).

Abnormal Breathing:	Slow, rapid, periodic, noisy, struggling, or absent breathing.
Shock:	Tachycardia, cool fingers/toes, \pm SBP < 90mmHg(adults).
Decreased LOC:	GCS <14

Patients with severe trauma have injuries that are immediately life threatening.

In order of rapidity of death, injuries that cause exsanguinating haemorrhage, impair the patency of the airway, the ventilation of the lungs, the circulation of the blood, and the level of consciousness are potentially lethal. Death caused by these injuries can frequently be prevented by early, appropriate resuscitation and treatment by skilled staff. Morbidity from these injuries is also likely to be substantially reduced. The patient then has a chance to stay alive long enough to have accurate diagnosis of all their injuries and to receive definitive treatment for them.

THE TRAUMA TEAM

MEMBERS

The members of the Trauma Team are:

Team Leader: usually Emergency Physician

Anaesthetic registrar or Duty Anaesthetist

ED Registrar

ICU Registrar

General Surgery Registrar

The junior medical staff are backed up by their respective consultants.

ED Nursing Staff

Trauma Clinical Nurse Specialist

ED Radiographers

INITIATION OF A TRAUMA CALL

The call is usually initiated by the ED nursing staff after receiving a radio notification from ambulance (or helicopter) that they are transporting a patient who has severe trauma (cf definition).

The Trauma Team is activated by dialling 777 to call the Operator.

Patients with severe trauma may arrive without the Trauma Team being notified if:

- 1 Their level of trauma is underestimated by ambulance officers
- 2 If the patient is not brought to hospital by ambulance
- 3 If they are transferred from another hospital and deteriorate en route

It is then the responsibility of the ED nursing and/or medical staff to assess the patient and to initiate the "Trauma Call" if the patient has abnormal breathing, shock, or a decreased level of consciousness.

They must then begin resuscitation while waiting for the other team members to arrive.

TRAUMA CALL PRIORITIES AND RESPONSIBILITIES

Trauma Team members must attend the Trauma Call immediately. These calls take precedence over other responsibilities.

DO NOT ring the ED to find out if you are needed, because you are needed. Ensure you notify that you are responding using the AtHoc app on the emergency phone. If you are unable to immediately attend due to another emergency, you must check that the anaesthetic registrar (or duty anaesthetist) is attending, otherwise contact the the ICU specialist or SR.

The general surgical registrar may be unable to attend because they are in theatre. It is the responsibility of the general surgical registrar to nominate another person if he/she is unable to attend. This **may** be the orthopaedic registrar, the general surgical consultant or an appropriately experienced person. This person **must not** be a house surgeon.

OTHER SPECIALTIES

The on call paediatric surgeon will be notified as soon as possible of all paediatric trauma patients, and the on call obstetrician will be notified about all pregnant trauma patients.

ASSESSMENT AND RESUSCITATION

GENERAL PRINCIPLES

These principles apply to the management of all patients.

Humans stay alive because:

- 1 **Air moves in** (oxygen) **and out** (carbon dioxide) of their lungs and
- 2 Their heart pumps oxygenated **blood round and round** their body.

Unless you are able to keep these things happening you won't get a chance to find out, before the pathologist, what problems your patient had.

Assessment and resuscitation happen simultaneously. As you find a life threatening problem you fix it. You look for and treat problems in the following order:

- A** irway
- B** reathing
- C** irculation
- D** isability (LOC & neurologic problems)
- E** xposure (uncover the whole patient) / **E** nvironment (keep the patient warm)

You follow this order because untreated problems from the top of the list kill your patient faster than problems lower down.

Decreased LOC is life threatening.

- 1 Immediately because it threatens the airway and
- 2 Later because of the possibility of secondary brain injury from hypoxia and hypoperfusion leading to brain death.

SPECIFIC PRINCIPLES FOR THE SEVERE TRAUMA PATIENT

AIRWAY

You must make sure the patient has an airway through which they can breathe.
Use if necessary:

- Chin lift / jaw thrust ± oro/nasopharyngeal airways
- Endotracheal intubation
- Surgical cricothyroidotomy

Intubate patient early on clinical grounds of poor airway or inadequate breathing or coma (GCS 8 or less). Do not wait for blood gases to make the decision.

If patient is unconscious, you must protect their cervical spine. Unconscious patients with injury above the clavicle have a 5 - 10% incidence of cervical spine injury. Maintain the spine in neutral alignment and prevent any excessive movements.

BREATHING

- 1 Give oxygen to all trauma patients initially.
- 2 If you need to assist their ventilation use a self inflating bag/mask with reservoir bag. Patients requiring assisted ventilation need to be intubated and ventilated
- 3 Look for tracheal deviation, unequal air entry, surgical emphysema, air hunger and shock

- Treat a clinical tension pneumothorax with IV cannula thoracostomy - decompress in 4-5th intercostal space between mid & anterior axillary line. If unsuccessful consider finger thoracostomy. The chest drain can come later. All chest drains will be inserted by blunt dissection
- 4 Cover an open sucking chest wall wound and insert a chest drain.
 - 5 Drain a massive haemothorax and simultaneously restore blood volume (see below).
 - 6 Recognise a flail chest. Maintain oxygenation and prepare to intubate and ventilate.

CIRCULATION

- 1 Stop any external bleeding by application of direct pressure to the site. Consider tourniquet for severe haemorrhage from limb trauma
- 2 Insert two short large bore (16 gauge or larger) IV cannulae, preferably into the arm veins. An intraosseous needle is an option in a severely shocked patient with poor venous access
- 3 Take off your blood samples NOW before you forget - there are pre-filled blood request forms in the ED
- 4 Assess the circulation. Pulse rate, peripheral perfusion, and BP.
- 5 If the patient has evidence for a clinical diagnosis of shock, give a fluid bolus (adults), 20ml/kg (children). If the patient is mildly shocked, start with crystalloid, up to 1L - if more than 1L is given you should consider moving to blood products. If the patient is severely shocked or actively bleeding (2 or more of: penetrating mechanism, HR>120/min, SBP<90mmHg or positive FAST scan) then consider massive transfusion protocol activation.

Administer tranexamic acid 1g over 10min, followed by 1g infusion over subsequent 8hrs

Do not insert a central line.

Infuse fluids **through a giving set with an in-line pump via a fluid warmer**

- 6 Assess response to IV fluids:

Responder: No ongoing requirement for fluids.

Transient responder: Pulse rate/BP/perfusion improve and then deteriorate, will probably need blood soon. (See **Unstable Circulation** below).

Non Responder: May require surgery to treat shock by stopping bleeding, will require blood, probably MTP, with consideration for O-ve or group specific until cross matched units available (See **Unstable Circulation** below and **Appendix 2 - Blood Products for Life Threatening Bleeding**).

DISABILITY

- 1 Assess pupils, GCS, and lateralising signs.
- 2 Treat hypoxia and hypotension effectively. These problems markedly worsen the outcome of brain injury.

EXPOSURE

- 1 Remove **ALL** of the patients clothing. This allows you to easily look everywhere for injuries.
- 2 Cover patient with forced air warmer to minimise heat loss.

FORGOTTEN

1 Oxygen.

2 Two IV cannulae.

3 Blood samples.

4 Monitoring: ECG.BP cuff - cycle frequently. Pulse oximetry. E_TCO₂ - to confirm ETT placement.
Urinary catheter - NB meatal blood, bruised testicles.
Nasogastric tube (radio-opaque) - NB facial or base of skull fractures.

5 Pain Relief:

Give analgesia, early. Titrate IV fentanyl, morphine or ketamine

6 Infection Control:

Antibiotics are indicated for prophylaxis for compound bone fractures or skull fractures with a CSF leak or air inside the cranium, and for treatment of contaminated wounds.

Tetanus toxoid as indicated for all wounds.

7 ID Bracelet On:

All major trauma patients will have an identification bracelet attached as soon as possible. The identification bracelet is to contain a unique identifying number. When the patient is able to be identified within five minutes, the bracelet will have their name and National Patient ID number eg. ABC1234.

If the patient is unable to be adequately identified within five minutes, they will be given a National Patient ID number. They will be called "unknown male" or "unknown female". In the event of more than one unknown patient, they will be numbered sequentially "unknown male 1", "unknown male 2".

The National Patient ID number is crucial for handling admission details, x-rays, and laboratory results, especially Transfusion Medicine. Confusion over inadequately identified crossmatch samples in a resuscitation involving more than one patient could easily be fatal.

The bracelet with the ED assigned number should remain on the "unknown" patient until they are discharged from hospital, at which point their records will be merged.

NB: A name and date of birth are not sufficient by themselves for Transfusion Medicine Department identification protocols.

UNSTABLE CIRCULATION

There are five sites where significant blood loss can occur. Blood loss may be from more than one site. Urgent surgery may be required to achieve a stable circulation and so complete resuscitation.

1 External:

On the floor etc from lacerations, often at the scene, often difficult to quantify. Control bleeding by direct compression and/or tourniquet use

2 Chest:

Bedside CXR should be undertaken within the first 15 minutes. Insert chest drains for pneumo or haemothorax. If more than 1500ml of blood is drained initially or 200 - 300ml per hour thereafter, then the patient should be discussed with cardiothoracics. Contained thoracic arch aortic tears do not produce profoundly hypotensive patients, and uncontained tears produce sudden death.

3 Abdomen:

Diagnose by:

a) FAST scan

b) CT scan

c) Laparotomy

Indicated in unstable patients with obvious intra-abdominal haemorrhage (severe pain, peritonism, and distension).

4 Pelvis:

Diagnose clinically and by pelvic x-ray.

Bleeding from pelvic fractures requires on average an eight unit transfusion and can be massive.

Early use of a pelvic binder will reduce the pelvic volume into which bleeding can occur

Bleeding may need external pelvic fixation or arterial embolisation to slow or stop the loss.

Patients often need laparotomy for associated injuries.

5 Long bone fractures:

Fractured femur in particular can lead to 1-1.5L blood loss into the tissues of the thigh. Bilateral femur fractures are therefore a life threatening condition in themselves. Reduce fractures with splinting (e.g traction splint for femoral fractures) and early surgery

SECONDARY SURVEY

A head to toe examination should be performed, and a comprehensive list of injuries documented. You must ensure you examine the patients' back as missed injuries can otherwise occur.

X-RAYS IN THE RESUSCITATION ROOM

Only two x-ray examinations are routinely indicated in the resuscitation room.

Do these early whilst preparing the patient for transfer to CT or the OR.

CHEST X-RAY

Done on **all patients**, and ideally **after the insertion of the endotracheal and radio-opaque gastric tube**.

Clinically obvious pneumo/haemothoraces can be drained before the x-ray.

If the patient needs intubating then do it before the chest x-ray so the endotracheal tube position can be checked.

All wide mediastinums on chest x-rays need to have an aortic injury excluded. This will usually be by contrast CT, but if the patient ends up going directly to the OR, consideration should be given to intraoperative transoesophageal echocardiogram.

PELVIS

Plain x-ray is indicated for all head injured or multiply injured patients.

EVALUATE ALL INJURIES

Severe trauma patients usually have multiple injuries. You should assume the presence of injury until you can show otherwise.

The overall severity of their injury is related to the number of injuries and the severity of individual injuries.

Evaluate all injuries systematically by body region.

Head: Includes scalp, and looking in ears and eyes (inc visual acuity).

Face: Clinical examination for fractures/lacerations.

Neck: clinical examination and usually imaging

Chest: CXR plus clinical examination.

Abdomen: Clinical exam and PR.

Back: Must be viewed by log rolling.

Pelvis: Pelvic x-ray and clinical examination. Look for PR blood and consider PV. Do not place a urethral catheter if meatal blood or bruised testicles is present. In this case a retrograde urethrogram should be considered (see **Other Imaging** below).

Arms/legs: Clinical examination only in the resuscitation room. Fractures of the small bones of hands and feet are commonly missed and can cause major long term problems if not recognised and treated appropriately.

Some notes on three specific body regions.

ABDOMEN

Examination includes rectal exam in all patients.

Clinical examination of the abdomen is only reliable if:

- 1 The patient is awake and alert - GCS 15, not intoxicated.
- 2 Clinical examination can be repeated at anytime ie the patient is not about to have a long anaesthetic or be ventilated in the ICU.
- 3 The patient does not have:
 - spinal cord injury
 - rib fractures
 - abdominal wall contusions and/or abrasions

If clinical examination is unreliable by the above definition, then the abdomen must be examined definitively by another method.

The definitive examination is usually CT with intravenous contrast.

If the patient is severely unstable and FAST positive they may need to go urgently to the OR.

BACK/SPINE

Presume the patient has a spinal column injury until you can show otherwise.

Do not forget to log roll the patient to inspect the back and palpate the spine.

Spinal column fractures are also commonly missed injuries.

NEUROLOGIC

Examine the patient to determine their level of consciousness using the Glasgow Coma Score (GCS: verbal response, motor response, eye opening), the function of their spinal cord (do all four limbs move) and the pupil responses. This can be completed in one to two minutes.

EARLY TREATMENT OF TRAUMATIC BRAIN INJURIES

Severe traumatic brain injuries occur in 40% of our trauma. Assessment and management priorities can be difficult when other injuries are present. Shock, hypoxia, hypothermia, alcohol and other drugs may depress the level of consciousness and worsen neurologic signs. However all coma is treated as being due to a head injury until investigations are complete.

Inadequately treated hypoxia and shock markedly worsen the outcome following brain injury.

TREATMENT

Ensure adequate oxygenation and circulation (see **Assessment & Resuscitation** above).

All patients with coma (GCS <10) should be intubated early and normo ventilated to protect their airway and ensure adequate breathing.

All patients with GCS ≤13 need a CT scan of their head and those with a GCS of 9 - 13 may need intubating to facilitate the scan. After being intubated, patients should be paralysed and generously sedated.

In an unstable patient who needs a laparotomy for abdominal bleeding and a CT scan of the head, the laparotomy should take priority.

RADIOLOGY FOR TRAUMA PATIENTS

Early Imaging in Major Trauma

ADULTS



A whole body trauma CT (WBCT) in Wellington Hospital is a non-contrast CT of the head and c-spine, and split bolus IV contrast enhanced CT of the chest, abdomen and pelvis to achieve arterial and venous enhancement. This pathway is a decision tool to help decide the most appropriate urgent imaging for severely injured trauma patients only.

All patients with haemodynamic instability need an urgent bedside pelvic X-ray in addition to the chest, or pelvic binder applied prior to CT.

Exclusions

1. All paediatric patients (under 16 years old). See children and young adult pathway.
 2. All patients who present with a fall from standing height.
- Please refer to the 'Other patients' box for all patients who suffer a fall from standing height.

CXR is the first-line investigation. Further imaging as clinically appropriate

STEP 1

Pre-hospital Indications
Intubated pre-hospital, OR clinical suspicion of spinal cord injury

Request WBCT

STEP 2

Clinical Indications

Two or more regions of injury suspected (e.g. Head + Chest or Chest + Pelvis- extremities are not included)

WBCT If 2 or more criteria present

HIGH-RISK MECHANISM:
MVA>50km/h,
Ped/cyclist MVA,
Motorcycle/Quad,
Fall>5m

TWO OR MORE REGIONS OF INJURY SUSPECTED:
(eg. Head + Chest or
Chest + Pelvis)

UNSTABLE VITAL SIGNS:
SBP<100,
HR>100,
RR>24,
Sats <93%

GCS<14

ELDERLY (>75yrs)

Other patients

CXR is recommended as first line, then clinical judgement to guide further imaging decisions such as focused CT. A WBCT may still be requested if thought clinically indicated.

Trauma CT (including WBCT) requires a large-bore IV line in the ACF (18g or greater).

It is helpful for radiology to know the most recent eGFR, and where possible patient consent should be obtained for contrast in the absence of known renal function.

Reference: please refer to the CCDHB guideline Early Radiological imaging in major trauma - CapitalDocs ID: 1.102562

OTHER IMAGING

Angiography

This may be required to assess vascular injuries and occasionally for embolisation of bleeding vessels. Discuss with the on call endovascular consultant.

Urethrography

Patients with blood at the urethral meatus need a urethrogram to exclude urethral injury. Patients should have had a pelvic x-ray and rectal examination. If urethral trauma is present a suprapubic catheter is inserted. Bladder rupture may occur with or without urethral injury and can only be excluded by a stress cystogram.

MANAGEMENT OF BLEEDING ASSOCIATED WITH PELVIC FRACTURES

If the patient is shocked then it is important to consider the potential sites of bleeding, those being: external bleeding from lacerations, chest, intra-abdominal; pelvis and multiple long bone fractures.

Firstly, arrest any significant external bleeding.

Secondly, do a chest x-ray and pelvic x-ray. Chest x-ray will exclude significant intrathoracic bleeding and the pelvic x-ray will confirm the clinical suspicions of pelvic fractures.

Apply a pelvic binder as this will reduce the potential volume in the pelvis into which bleeding can occur. The majority of pelvic bleeding is from the venous plexus structures, and this is generally self limiting if the pelvic volume can be contained. It may be necessary to place an external fixator system to limit pelvic movement and ongoing bleeding.

Approximately 10-15% of pelvic bleeding is arterial, and this is more difficult to control and can lead to ongoing persistent haemorrhage into the pelvis and retroperitoneum. The optimal management for arterial pelvic bleeding is angioembolisation. If pelvic arterial bleeding is suspected (usually based on an arterial blush seen during the trauma CT) then discussion should be held with the endovascular consultant on call.

Preperitoneal pelvic packing is also an option for control of pelvic bleeding.

If a patient is cardiovascularly stable but has a pelvic fracture with a high likelihood of bleeding, it may be appropriate to consider admitting them to Intensive Care for observation for the first 12 - 24 hours or so. They often deteriorate from slow but persistent bleeding.

ADMINISTRATION

The surgical registrar and intensive care registrar will write clinical notes on all the patients they see. Include the name of your specialist if you have discussed the patient with them, and who is to be responsible for the further care of the patient within the hospital.

TRANSFERS

When we transfer trauma patients in from other hospitals we must make sure they are reviewed on admission in a similar way.

Intubated patients will be admitted to ICU and reviewed by the surgical registrar.

Non-ventilated patients are taken to ED and reviewed by the Trauma Team.

Following the patient's initial assessment the other specialties can be contacted.

PLACEMENT

The patient should have their investigations and treatment in the Resus bay completed in 45 minutes. At this time a decision should have been made where the patient is to go to next. This may be to CT / Theatre / ICU / Ward / stay in ED. The hospital target is trauma CT in under 60 minutes from time of arrival. If the patient is unstable, the full trauma team should accompany the patient to the CT scanner and continue resuscitation.

Patients with major injuries to two body regions should be managed in ICU.

Patients being admitted to ICU are the responsibility of the ICU registrar if they are to have further investigations (eg CT), or if going to theatre prior to arrival in ICU.

Patients to be admitted to surgical or orthopaedic wards will be the responsibility of the general surgical or orthopaedic registrar. They will be responsible for looking after the patient if they require a further investigation such as a CT.

Patients may be reviewed by the Trauma Team and may not need admission to hospital. These patients can be handed over to the ED staff for further observation or investigation. It is the responsibility of both ICU and general surgical registrars to arrange formal handover, documentation and placement.

APPENDIX 8A - BLOOD PRODUCTS FOR MAJOR TRAUMA PATIENTS

PATIENT IDENTIFICATION

see above

BLOOD SAMPLES FOR CROSSMATCHING

Patient identification information as outlined above, must be hand-written onto the tube. It is important that the person responsible for writing this information personally identifies which patient the blood was taken from and checks the unique identifying number of that patient. The cross match form will be completed by hand, using the same identification information.

C&CDHB Adult Massive Transfusion Protocol (2013)

Team Leader Responsibilities:

- Team Leader should be a registrar or consultant
- Notify Coag Lab and send Coag requests on Lab Request form marked urgent
- Activate protocol by ringing Blood Bank (ext 6961) and say "I am activating the Massive Transfusion Protocol"
- Call for each box as required
- Make a decision to cease MTP and contact Blood Bank

Blood Bank Responsibilities:

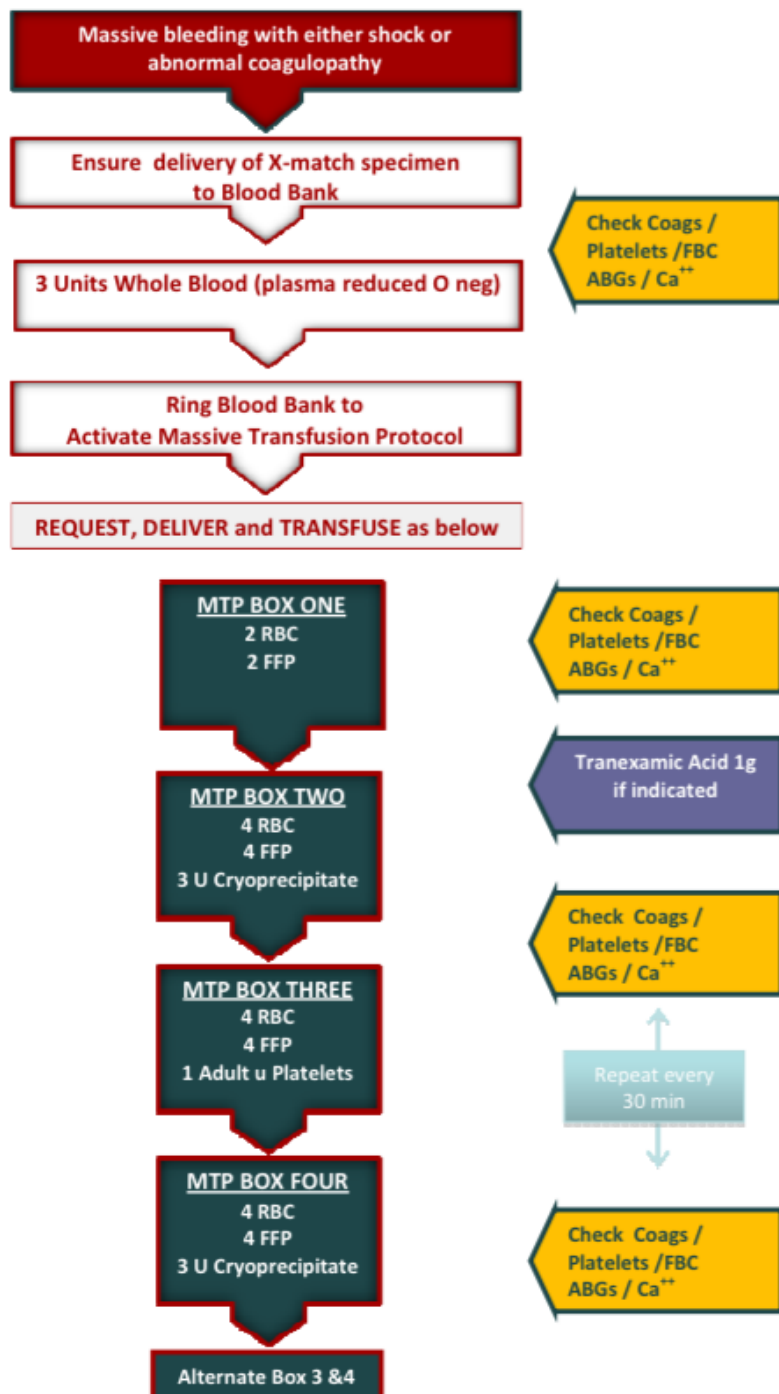
- Ensure X-match sample processed ASAP after O Neg release
- Notify NZBS Medical Officer after issuing MTP Box Four
- Thaw next box in advance and await request

Contacts:

- Blood Bank – Ext 6961/6962
- Coagulation Lab - Ext 5749

Additional treatment thresholds:

- if PR >1.5 or APTT >40 consider additional 4 units FFP
- if fibrinogen <1g/L consider additional 3U Cryoprecipitate
- if platelets <75 x10⁹/L consider additional one pack platelets
- if ionized Ca⁺⁺ <1mmol/L give 10mls



APPENDIX 8B - ICU FORMS: TRAUMA SUMMARY & SPINAL CARE ORDERS

All patients should have a Major Trauma Admission Form completed as part of their admission, along with a Spinal Care Orders sticker to document the status of the cervical spine. The most recent versions of both of these forms can always be downloaded from the Wellington ICU website (<https://forms.wellingtonicu.com>).

The Major Trauma Admission Form is used to document the secondary survey once the patient arrives in ICU so that all injuries can be summarised graphically, along with the relevant history around the traumatic event. The final page is used to summarise all radiology to date along with all other teams involved in the patient's management.

The ICU Spinal Care Orders is used to provide safety around a patient's spine where injury is either likely, suspected or proven. It is important to make a decision to clear or treat a patient's cervical spine promptly, as immobilisation, collars and log rolls will impede patient care if they are not actually required. See the DHB spine clearance policy for more detail on clearing the cervical spine.

APPENDIX 9

ICU MEDICAL STAFF DAILY ALLOCATION

WEEKDAY ICU MEDICAL STAFF ALLOCATION

DOCTOR	0800-0830	0830-1030	1030	1100-1600	1600-1700	1700-2100	2100-2200	2200-0800
Night RMO							Ward Round	Ward work, MET, ward reviews
Night RMO								
North SMO/SR								SR remains on call Tue-Thu
Long day RMO	Combined Handover, ICU Seminar Room	Ward round beds 8-16		Ward work North	Handover & ward round beginning at bed 19 (South)	SMO available to attend if unit busy*		
Central SMO		Ward round beds 1-7, 17-18	X-ray meeting, Radiology Dept.	Ward work Central		Ward work North & Central	Ward Round	On call for ICU
Short day RMO								
South SMO		Ward round beds 19-24		Ward work South				
Long day RMO						Ward work South	Ward Round	
Evening RMO								
Flight Day RMO								
Flight Night RMO								

*North SMO goes home after 4pm ward round. Can be asked by Central SMO to stay or attend if unit busy. North SMO will attend 2100 ward round if ≥18 patients with ICU split into North & South rounds, meeting to round on Central and then handover all patients to Central SMO. After this, North SMO goes home & has no responsibility overnight.

WEEKEND & PUBLIC HOLIDAY ICU MEDICAL STAFF ALLOCATION

DOCTOR	0800-0830	0830-1200	1200-1600	1700-2100	2100-2200	2200-0800
Night RMO						
Night RMO						
SMO 1						
Long day RMO						
Long day RMO						
SMO 2						
Flight Day RMO						
Flight Night RMO						

Ward work, MET, ward reviews

Combined
handover &
ward round

On call for all ICU calls

On call for all ICU calls

Ward work, MET, ward
reviewsWard work MET, ward
reviewsWard round
beds 1-12Ward round
beds 13-24*Combined
Handover,
ICU Seminar
Room

Shift 0700-1900 (on-call); working in ICU 0800-1700

Shift 1900-0700 (on-call)

*SMO 2 hands over half of unit after ICU ward round to SMO 1

SMO 1 & SMO 2 swap roles from 8am the following weekend day

REGULAR ICU MEETINGS

DAY	TIME	MEETING	LOCATION
Monday	2300	Hospital At Night	MAPU Seminar Room
Tuesday	1000-1030	Neurosurgical Grand Round	ICU Main Unit
	1100	Infectious Diseases	ICU Fishbowl
	1500	Multidisciplinary Team Meeting	ICU Fishbowl
	2300	Hospital At Night	MAPU Seminar Room
Wednesday	2300	Hospital At Night	MAPU Seminar Room
Thursday	1200-1500	ICU Registrar Teaching +/- Simulation	ICU Seminar Room
	2300	Hospital At Night	MAPU Seminar Room
Friday	1100	Infectious Diseases	ICU Fishbowl
	1300	Journal Club	ICU Seminar Room
	1330	Mortality & Morbidity	ICU Seminar Room
	2300	Hospital At Night	MAPU Seminar Room
	2300	Hospital At Night	MAPU Seminar Room
Saturday	2300	Hospital At Night	MAPU Seminar Room
Sunday	2300	Hospital At Night	MAPU Seminar Room

END OF LIFE CARE IN THE ICU



A reference guide for
registrars



Contents

Introduction to End of Life in the ICU	3
Before Death	4
Goals of Care	4
Allow a Natural Death In ICU (AND-ICU) Form	4
Te Ara Whakapiri (The Unifying Pathway)	5
Symptom Management	5
After Death.....	6
Organ and Tissue Donation.....	6
Mortality Paperwork.....	7
Death Paperwork Checklist.....	7
Covid-19 Deaths	8
Documenting Life Extinct	8
Record of Death Form.....	8
Medical Certificate of Cause of Death and Cremation Certificates	9
RealMe ID.....	9
DeathDocs	9
Death Notification to GP	10
Database Discharge Summary	12
Concerto Discharge Summary.....	12
Coroner's Cases.....	14
Verification of Death	14
Police	14
Medical Certificates of Cause of Death.....	15
Medical Certificate for Cause of Death Examples.....	16
Out of hospital cardiac arrest with HIE	16
Intracranial haemorrhages.....	16
Medically expected complications of surgery	17
Malignancies	17
Haematological malignancies	18
Pancreatitis	18
Genetic conditions	18
Complications related to events in the distant past.....	19
Immunosuppression	19
More than one contributing factor.....	19

Introduction to End of Life in the ICU

This guide was created as an introduction to end of life care in the ICU and to help navigate the paperwork that needs to be completed when a patient dies. There are explanations as to the paperwork you will find relevant to end of life care, symbols you will see in ICU when a patient has died, and the paperwork that needs to be completed after a death. There are some examples of some Medical Certificates of Cause of Death which may be of assistance for some common ICU scenarios.

Approximately 8% of our patients in ICU die during their admission so you will encounter a lot of death over your time working here. We are all human and whilst as doctors we are accustomed to dealing with death there will be some deaths that may affect you more than others. If this is the case and you wish to discuss anything further we would encourage you to talk to one of the consultants or our clinical psychologist who may be able to assist or to steer you in the direction of some resources should they be required.



Before Death

Goals of Care

Intensive Care Unit (ICU) Treatment Goals

WELLINGTON ICU ONLY

Limitations can only be set when medically indicated and after discussion with an ICU Specialist. The patient, family, whānau or advocate should be informed of any limitation(s) as soon as practically possible.

☐ The goal of care is **curative or restorative**. This is the default. Treatment is aimed at prolongation of life. Full resuscitation and all ICU-level supports are medically indicated and in accordance with the patient's known wishes.

OR

☐ The goal of care is **curative or restorative** with treatment limitation(s). Continued progress will be supported but certain treatment modalities are likely to be of little or no benefit and should not be commenced. Specific limitations are:

☐ NOT FOR CPR OR ☐ For shocks only

AIRWAY: ☐ Not for intubation ☐ Not for airway adjuncts

BREATHING: ☐ Not for invasive ventilation ☐ Not for NIV ☐ Not for HFNP ☐ Not for increase in FiO₂ ☐ Not for BMV

CIRCULATION: ☐ Not for central vasoactives ☐ Vasoactives capped ☐ Not for peripheral vasoactives Specific: _____

OTHER: ☐ Not for renal replacement ☐ Not for anti-infectives Other specific limitation(s): _____

OR

☐ The goal of care is **comfort during the dying process**. Please complete the **Allow a Natural Death in ICU (AND-ICU)** form.

Name: _____ Signature: _____ Date: / /

Name of ICU SMO: _____ Time: _____

Any limitations only apply in Wellington ICU & for this ICU admission only. Upon discharge to a ward, please complete the hospital Goals of Care Plan and select the most appropriate option (A to D) after discussion with the ICU SMO.

ICU TREATMENT GOALS & LIMITATIONS

- Each patient in ICU should have a GOC form
- These should be done on admission and are on the Ward Round checklist on the patient's 24 hour observation chart

Allow a Natural Death In ICU (AND-ICU) Form

Intensive Care Unit AND-ICU

Capital & Coast District Health Board

Allow a Natural Death in ICU

DIAGNOSIS:

DETAILS OF LAST FAMILY/WHĀNAU MEETING

Names of family/whānau present: _____

Names of ICU/hospital staff present: _____

Issues discussed: _____

Patient involved in discussion: Yes ☐ No ☐

ICU SMO present: Yes ☐ No ☐

If not present, name of ICU SMO discussed with: _____

DO NOT ATTEMPT RESUSCITATION ORDERS:
In the event of cardiac or respiratory arrest, DO NOT PERFORM RESUSCITATION
Do not perform cardiac massage, defibrillation/cardioversion or intubation

Signed: _____ Name (please PRINT): _____

Please also complete the ICU Treatment Goals form or hospital Shared Goals of Care form

PROCESS CHECKLIST:

Admitting team & patient's GP informed: Yes ☐ No ☐ N/A ☐ Whom discussed with: _____

Palliative care team involvement: Yes ☐ No ☐ N/A ☐

Spiritual/religious/cultural support required: Yes ☐ No ☐ N/A ☐

Social work required: Yes ☐ No ☐ N/A ☐

Coronial notification required: Yes ☐ No ☐ N/A ☐

If Yes, notify family & write reason why: _____

Organ donation discussed (if applicable): Yes ☐ No ☐ N/A ☐

Tissue donation considered (if age <85): Yes ☐ No ☐ N/A ☐

Request return of tissue (e.g. bone flap): Yes ☐ No ☐ N/A ☐

Consideration of 'Going Home To Die': Yes ☐ No ☐ N/A ☐

PAR team informed (if required): Yes ☐ No ☐ N/A ☐

Move to private room (if available): Yes ☐ No ☐ N/A ☐

Specific requests by EPOA or via advanced directive for dying period: _____

Commence TEARA WHAKAPIRI Care in the last days of life pathway

AND-ICU form v6.1 July 2022 Area Practice

TREATMENT TO STOP: (at time agreed with family/whānau)

Respiratory support:

Reduce ventilatory support (please specify):

Extubate (ETT or tracheostomy): Yes ☐ No ☐ N/A ☐

Cease all supplemental oxygen therapy: Yes ☐ No ☐ N/A ☐

Cease/remove the following:

Vasoactive medications: Yes ☐ No ☐ N/A ☐

NG/PEG feed/TPN: Yes ☐ No ☐ N/A ☐

Antibiotics: Yes ☐ No ☐ N/A ☐

Intravenous fluids: Yes ☐ No ☐ N/A ☐ (Stopping can ↓ secretions)

Insulin: Yes ☐ No ☐ N/A ☐

Renal replacement: Yes ☐ No ☐ N/A ☐

Intra-aortic balloon pump: Yes ☐ No ☐ N/A ☐

Pacemaker: Yes ☐ No ☐ N/A ☐

(If internal +/- defibrillator, consider deactivation)

Remove the following:

NG tube: Yes ☐ No ☐ N/A ☐

Arterial line: Yes ☐ No ☐ N/A ☐

Peripheral cannula(e): Yes ☐ No ☐ N/A ☐

Urinary catheter: Yes ☐ No ☐ N/A ☐

ICP monitor/EVD: Yes ☐ No ☐ N/A ☐

Other (please specify): _____

Ensure adequate intravenous access for administration of palliative medication

Cease ICU documentation: use Te Ara Whakapiri documentation

Remove & cease ALL monitoring (pulse oximetry, ECG, blood pressure, CVP): Yes ☐ No ☐

Cease ALL further investigations (blood tests, radiology): Yes ☐ No ☐

Review medication chart & cease all non-palliative treatment as required

TREATMENT TO START: chart symptom-specific IV PRN treatment in AWAKE patients:

Pain: Morphine 2.5-5 mg q1h, Fentanyl 25-50 mcg q1h

Anxiety, distress or myoclonus: Midazolam 1-3 mg q1h

Nausea, vomiting or agitated delirium: Haloperidol 0.5-1 mg to max 3mg then Levomepromazine (Nozinan) 8.25-12.5 mg q4h

Secretions: Hyoscine Butylbromide (Buscopan) 20 mg q2h, max 120 mg/day

Baseline opiates & benzodiazepines should be continued in all patients with previous exposure. If the patient is awake then pre-existing infusions should continue. The PRN doses above assume no previous opiate or benzodiazepine exposure. Be wary of withdrawal symptoms if infusions are ceased in any patient. All infusions should be single agent only, symptom specific, titrated to effect & discussed with medical staff prior to escalation. Please give medication to treat the patient, not their family.

IF TRANSFERRING TO WARD:

Early conversion of intravenous medications listed above into subcut route: doses are the same. Consider need for continuous subcut syringe driver - call Palliative Care team (including out of hours) for advice. Ensure hospital Goals of Care form completed. Inform family of ward visiting policy around dying. Order air mattress to transfer patient directly onto ward bed on (avoid multiple transfers).

Name (Please PRINT): _____ Designation: _____

Signature: _____ Date: / / Time: _____

AND-ICU form v6.1 July 2022 Area Practice

- If there is agreement that the patient is dying then we can transition to allowing a natural death in ICU.
- This form will be completed to document what has been discussed, to clarify that the patient is not for resuscitation, and to indicate what medical devices should be removed.

Te Ara Whakapiri (The Unifying Pathway)

(Attach Label here or Complete Details)

NAME: _____ NHI: _____
GENDER: _____ DOB: _____ AGE: _____ WARD: _____

Capital & Coast District Health Board
Kaitiaki Take Kōwhiri

Te Ara Whakapiri - Care in the last days of life
Baseline assessment and preparation for care after death

Initiation requires consultation with patient, family/whānau and interdisciplinary team

Primary diagnosis:	Ethnicity:
Religion/fait:	Language(s):
Family/whānau spokesperson:	Relationship:
Phone number:	Ph any time <input type="checkbox"/> Not overnight <input type="checkbox"/> Other: _____
Enduring power of attorney (personal care and welfare):	Yes <input type="checkbox"/> No <input type="checkbox"/> Activated Yes <input type="checkbox"/> No <input type="checkbox"/>
Name:	Relationship:
Documents in place to guide care decisions (tick as many as apply):	Phone number: _____
Do not attempt cardiopulmonary resuscitation (DNACPR) <input type="checkbox"/>	Shared Goals of Care <input type="checkbox"/>
Advance Care Plan <input type="checkbox"/>	Advance Directive <input type="checkbox"/> None <input type="checkbox"/> Other: _____

Taha tinana – Physical health

The person is	Conscious <input type="checkbox"/>	Semi-conscious <input type="checkbox"/>	Unconscious <input type="checkbox"/>
In pain	<input type="checkbox"/>	Unable to swallow <input type="checkbox"/>	Confused/disorientated <input type="checkbox"/>
Agitated/restless	<input type="checkbox"/>	Incontinent of urine <input type="checkbox"/>	Experiencing respiratory tract secretions <input type="checkbox"/>
Nauseated	<input type="checkbox"/>	Catheterised <input type="checkbox"/>	
Vomiting	<input type="checkbox"/>	Incontinent of faeces <input type="checkbox"/>	At risk of skin breakdown <input type="checkbox"/>
Dyspnoeic	<input type="checkbox"/>	Constipated <input type="checkbox"/>	At risk of falling <input type="checkbox"/>

Describe any other symptoms: eg. oedema, sore mouth, myoclonic jerks, itching

Taha hinengaro – Psychological and mental health

The person is aware they are dying (document details/concerns below) Yes ☐ No ☐

Preferred place of death (if known): _____

Describe any emotional or psychological symptoms, concerns or preferences: _____

Te wairua – Spiritual health

The person has been asked about cultural and/or spiritual needs (document details/concerns below) Yes ☐

A spiritual/religious/fait person of choice has been contacted Yes ☐ N/A ☐ To be done ☐

Name: _____ Contact details: _____

Describe any cultural and/or spiritual needs, preferences/concerns: eg. rituals, prayers, music, access to pets

These sections can be completed by any registered staff member

Once a patient is on an allow a natural death pathway then they can be transitioned to Te Ara Whakapiri. This is a symptoms based assessment pathway for the dying patient

This can be started in ICU and can be continued on the ward if the patient is discharged from the ICU

Symptom Management

The AND-ICU form provides guidance as to what should be prescribed for symptom management. Chart these doses as a starting point and they can be adjusted in time if needed. A subcutaneous syringe driver infusion can be started in ICU. The Palliative Care service can assist with this prescription as required.

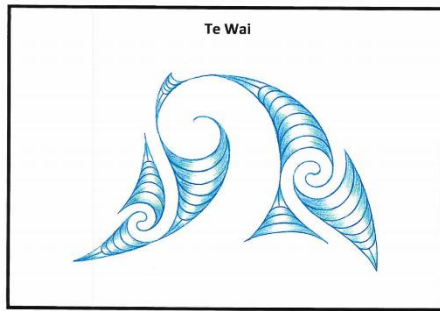
Consider starting symptom specific treatment in AWAKE patients for:

- Pain (Morphine 1-2.5 mg q1h, Fentanyl 10-25 mcg q1h)
- Anxiety or distress (Midazolam 1-3 mg q1h)
- Nausea or vomiting (Ondansetron 4-8 mg q6h, Haloperidol 0.5 mg PRN)
- Secretions (Buscopan 20 mg q2h, max 120 mg/day)

Baseline opiates should be continued in all patients with previous exposure. If the patient is awake then pre-existing infusions should continue. Be wary of withdrawal symptoms if infusions are ceased in any patient. Please give medication to treat the patient, not their family.

All infusions should be single agent only, symptom specific, titrated to effect & discussed with medical staff prior to escalation

After Death



If a death occurs in the ICU then you may notice this Te Wai symbol placed on the curtain or window of the room. This is to indicate that there is a recently deceased person in the bedspace. Please be respectful and mindful when you see this as there may be grieving family within earshot.



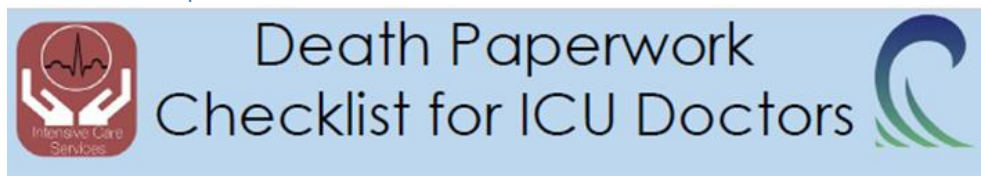
The Te Wai Ora bowl will also be filled with water and placed outside the rooms of recently deceased patients. This is to allow those who want to, to perform handwashing or a whakanoa ritual after being in the presence of the deceased.

Organ and Tissue Donation

It is our aim to offer donation to all eligible patients whether that be organ donation or tissue only donation. Potential organ donors will be identified prior to cessation of therapies and should be discussed with the consultant +/- Organ Donation NZ. Tissue donation can be offered up to 48 hours after death.

Mortality Paperwork

Death Paperwork Checklist



There is a lot of paperwork when there is a death and it is easy to miss bits out when you are busy. This is to remind you of the **compulsory** documentation that is required for each death*.

*Additional paperwork is needed for patients who go on to become organ donors

For the ICU Database the date and time of death (ie the time that death is certified by a doctor) is the Discharge Date and Time

Deaths related to COVID-19* (whether coronial or not):

- ☐ Regional Public Health COVID-19 Death Notification Form (found in Mortality Paperwork Folder)
- ☐ Email form to RPHIMT_SPOC@huttvalleydhb.org.nz
- ☐ Rest of paperwork as below

*see overleaf for which deaths this pertains to

Non-Coroner's Cases:

- ☐ Document life extinct in clinical notes
- ☐ Hospital Record of Death Form
- ☐ Medical Certificate of Cause of Death (preferably online and **print out 2 copies**)
- ☐ Cremation Form (preferably online and printed) – has to be completed by a doctor who has seen the body after death
- ☐ ICU Database D/C Summary (print out a copy for the notes)
- ☐ MAP D/C Summary (Ensure the **DATE & TIME** that death was certified by a doctor is documented in the D/C summary and print out a **one-sided** copy for the notes)
- ☐ Death Notification to GP in MAP
- ☐ Post mortem request and consent if applicable

Coroner's Cases:

- ☐ Document life extinct in clinical notes
- ☐ Verification of death form
- ☐ Hospital Record of Death Form – faxed to the National Initial Investigation Office
- ☐ ICU Database D/C Summary (print out a copy for the notes)
- ☐ MAP D/C Summary (Ensure the **DATE & TIME** that death was certified by a doctor is documented in the D/C summary and print out a **one-sided** copy for the notes)
- ☐ Death Notification to GP in MAP
- ☐ Police contacted (04 381 2000 – ask for Reporting Line)
- ☐ Inform family to remain nearby to allow formal identification with police

This checklist is found in the mortality packs. It outlines all the necessary documentation for each death in ICU. Please follow the checklist to avoid missing any important pieces of documentation.

You may need to allow at least 30 minutes to complete the paperwork required.



COVID-19 Death Notification

These forms can be found in the Mortality Paperwork Folder on the bookshelf in the fishbowl

Please complete this form on the date of death certification (or as soon after as practicable). The number of COVID-19 related deaths are reported daily by the Ministry.

Email completed form to RPHIMT_SPOC@huttvalleydhb.org.nz

If urgent contact the on-call MOoH via 04 570 9002

Deaths meeting the following criteria must be reported via this form:

- A person who dies within 28 days of testing positive for COVID-19
- A person for whom it is clear that COVID-19 is the cause of death (i.e. there are no underlying conditions that would account for death)
- A person who had (or who was subsequently found to have) COVID-19 when they died but their cause of death was clearly not COVID-19 related
- A person whose cause of death is still under investigation, e.g. it is being considered by the coroner, but the person was known to have had COVID-19 when they died

When reporting, please advise that the family/whānau have been informed of the death and that they understand that high level (non-identifying) details of the death will be released by the Ministry of Health: these details will be the age band, ethnicity, gender and DHB region.

A brief note in the body of the clinical notes is required to state that the deceased has been examined and verified as dead. **The date and time of the examination is the official time of death.**

[illegible]

Found in the Mortality Packs this form is required for all deaths. It is a coroner screening tool and can be faxed or emailed to the coroner office in the event that the death needs to be discussed with the coroner.

Medical Certificate of Cause of Death and Cremation Certificates

The preference is that these should be filled in **online**. In order to fill these in online you need to register for a RealMe ID.

Once you have a RealMe ID you can create an account to register as a medical practitioner through the DeathDocs website. Through this website you can then complete MCCDs and Cremation Certificates.

The advantage to this is that they are then immediately available to funeral directors, mortuary staff and whoever else may need to look at the paperwork. They are also easier to amend if amendments are required.

RealMe ID

Please set yourself up with a RealMe ID at:

www.RealMe.govt.nz

Once you've set up a RealMe account it will then need to be verified. For this you will need:

- RealMe Login
- Mobile phone for 2 factor authentication
- NZ Passport issued after 2004

If you don't have a NZ passport then you will need:

- NZ Citizenship certificate issued after 2004
- NZ immigration details
- NZ birth details

The link to DeathDocs is:

DeathDocs

The website is www.DeathDocs.services.govt.nz

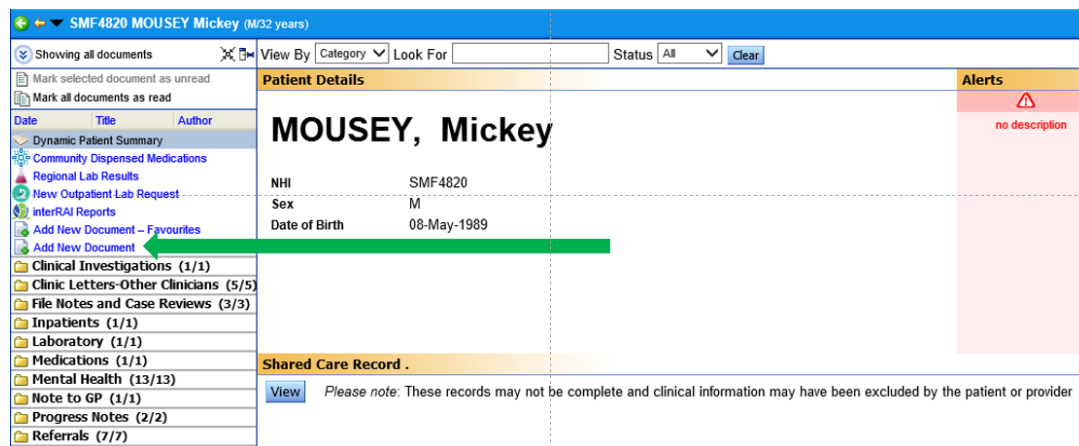
To register as a health practitioner you will need:

- A verified RealMe ID account
- Health Provider Index – Common Person Number (HPI-CPN) OR your MCNZ registration number

Please **complete a cremation certificate for ALL patients** regardless of whether the family has indicated that it is not needed. They may change their mind and it is easier to have done it at the time of completing all the paperwork. To complete a cremation certificate you need to have seen the body of the deceased

Once you have completed the MCCD and cremation certificates please **print out 2 copies** and place in the notes.

Death Notification to GP



SMF4820 MOUSEY Mickey (M/32 years)

Showing all documents View By Category Look For Status All Clear

Mark selected document as unread
Mark all documents as read

Date	Title	Author
Dynamic Patient Summary		
Community Dispensed Medications		
Regional Lab Results		
New Outpatient Lab Request		
InterRAI Reports		
Add New Document – Favourites		
Add New Document		
Clinical Investigations (1/1)		
Clinic Letters-Other Clinicians (5/5)		
File Notes and Case Reviews (3/3)		
Inpatients (1/1)		
Laboratory (1/1)		
Medications (1/1)		
Mental Health (13/13)		
Note to GP (1/1)		
Progress Notes (2/2)		
Referrals (7/7)		

Patient Details

MOUSEY, Mickey

NHI SMF4820
Sex M
Date of Birth 08-May-1989

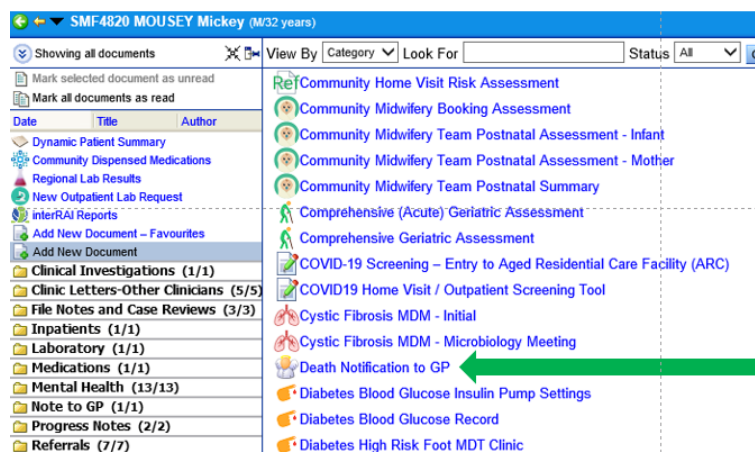
Alerts

no description

Shared Care Record

View Please note: These records may not be complete and clinical information may have been excluded by the patient or provider

Select Add New Document then scroll down to find “Death Notification To GP”



SMF4820 MOUSEY Mickey (M/32 years)

Showing all documents View By Category Look For Status All Clear

Mark selected document as unread
Mark all documents as read

Date	Title	Author
Dynamic Patient Summary		
Community Dispensed Medications		
Regional Lab Results		
New Outpatient Lab Request		
InterRAI Reports		
Add New Document – Favourites		
Add New Document		
Clinical Investigations (1/1)		
Clinic Letters-Other Clinicians (5/5)		
File Notes and Case Reviews (3/3)		
Inpatients (1/1)		
Laboratory (1/1)		
Medications (1/1)		
Mental Health (13/13)		
Note to GP (1/1)		
Progress Notes (2/2)		
Referrals (7/7)		

Community Home Visit Risk Assessment
Community Midwifery Booking Assessment
Community Midwifery Team Postnatal Assessment - Infant
Community Midwifery Team Postnatal Assessment - Mother
Community Midwifery Team Postnatal Summary
Comprehensive (Acute) Geriatric Assessment
Comprehensive Geriatric Assessment
COVID-19 Screening – Entry to Aged Residential Care Facility (ARC)
COVID19 Home Visit / Outpatient Screening Tool
Cystic Fibrosis MDM - Initial
Cystic Fibrosis MDM - Microbiology Meeting
Death Notification to GP
Diabetes Blood Glucose Insulin Pump Settings
Diabetes Blood Glucose Record
Diabetes High Risk Foot MDT Clinic

Complete the Death Notification to GP and finalise by pressing “FINISH”

View By Look For Status

Capital & Coast District Health Board
Ōpoko ki te Uru Hauora

Death Notification to GP (Death Notification)

MR MICKEY MOUSEY
 SMF4820

To: GP

Cc to GPs only:

Notification of Death

Dear Doctor,

It is with regret that I have to inform you of the death of your patient.

Your patient died in ward *

Their date of death is *

They were under the care of *

Details leading to the patient's death *

Clinician Details

Clinician Name *

Role *

Date * 04/08/2021

Further information to follow in the inpatient discharge summary.

Instructions

When you have finished click the 'Finish' button to finalise the Note and send it to the GP's Patient Management system. Please note that clicking 'Save' only saves your changes and will NOT send it to the GP.

If you have cc'd a recipient other than a GP you will need to Print and send the copy to them.

This doesn't need to be printed – this will get sent electronically to the patient's GP.

Help Home
 Logout
 Clinical Audit
 Search
 Whiteboard
 Worklists
 Knowledge Base
 My Details
 My Details
 Change Hosp/Ward/Dept
 Change Hosp/Printer
 Homepage
 Medical Documents
 Inpatient List
 Outpatient List
 Booking Lists
 Medical Records Lists
 Referral Lists
 Referral Functions
 Theatre Lists
 HRAIDS Lists

Clinic
 Clinic
 Clinic
 Clinic
 Clinic
 Clinic
 Clinic
 Patient Site Code
 Clinic List Out
 Favourite Outpatient Search
 Clinical Audit Data Enterers
 My Audit Consultants
 Clinicians
 NZMC Number
 eNotes
 Role
 Service
 Additional Services
 Delegates
 Favourite Filter Roles
 Signature
 Favourite Documents
 My Add New Document Favourites

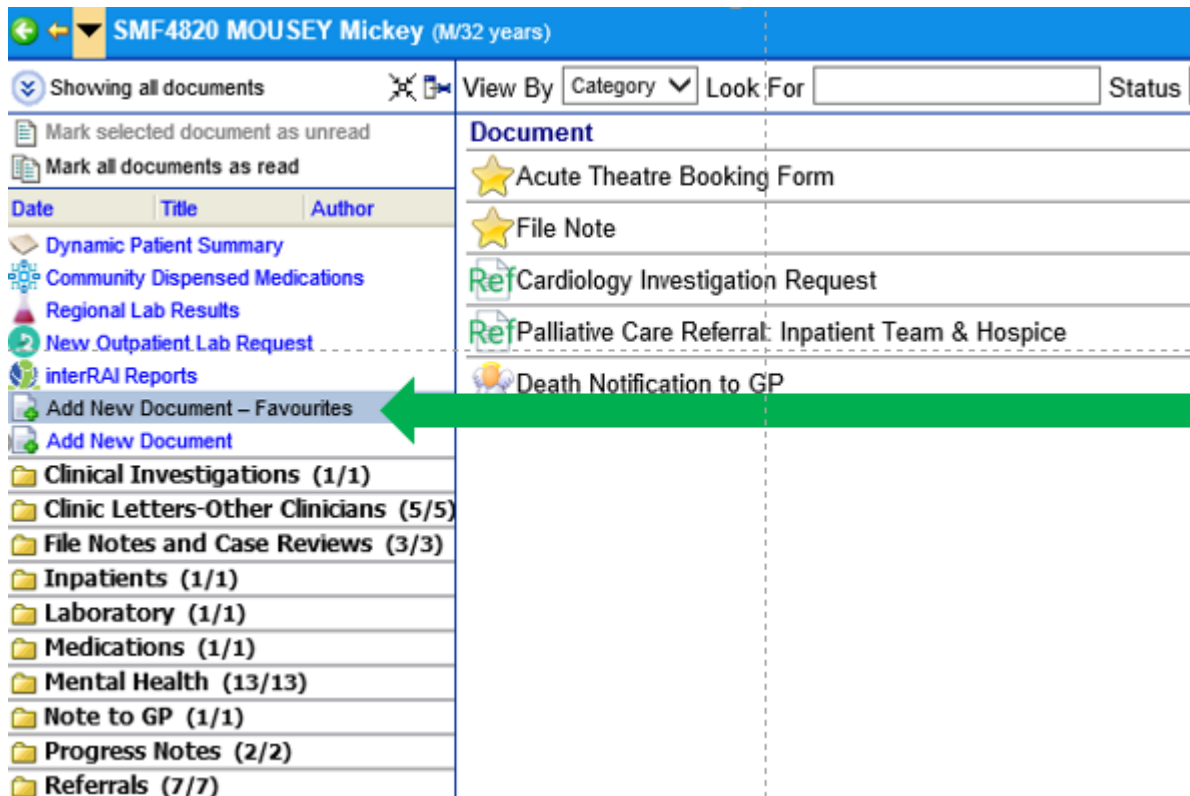
Reset
 Reset
 Reset
 Reset
 Reset
 Reset

Consultant
 Intensive Care
 Intensive Care

Death Notification to GP
 Palliative Care Referral: Inpatient Team & Hospice
 Cardiology Investigation Request
 Acute Theatre Booking Form
 File Note

I would recommend setting up some favourites in your profile for commonly used documents.

These will then become available in Add New Document - Favourites









Complete a discharge summary in the free text box opposite the admission note.

Print out a copy of the discharge summary for the notes.

This is a hospital discharge summary that will get sent out automatically to the patient's GP.


Confirm you have the correct patient and select the “Episode List” icon from the Clinical Documents



Episode No.	Admitted	Discharged	Consultant	Hospital	Episode Type
 123456780	13/03/2020 10:30			Wellington Hosp	Outpatient
 123456340	12/03/2020 09:27			Wellington Hosp	Outpatient
 123456334	06/03/2020 13:30			Wellington Hosp	Outpatient
 123455424	05/03/2020 10:30			Wellington Hosp	Outpatient
 123453245	26/02/2020 15:00			Wellington Hosp	Outpatient
 123453977	25/02/2020 13:55			Wellington Hosp	Inpatient

This will take you to a list of patient episodes. Select the + sign next to the episode related to the current admission. This will likely be the most recent “inpatient” episode.

Click on Create below Discharge Summary

123453977	25/02/2020 13:55	Wellington Hosp	Inpatient	Thoracic Surgery
Inpatient, Thoracic Surgery, Episode No: 123453977				
Discharge Summary		Create Date Time	Last Update Date Time	Clinician
 To be created				Status
				Version

Select Deceased Patient D/C Summary

ICU | B15

Hospital

Discharge Summary

Surgery

Summary)

The layout and sections in a document are determined by the template on which it is based. New documents are created from a default template determined by the patient's episode type and the specialty of the consultant responsible for their care. If alternative templates are available, they will be listed below and may be selected by clicking its title. It is not possible to select an alternative template for a document that has previously been finalized. 2 templates are defined for the current specialty. Select a template for the current document type:

- Deceased Pt D/C Summary

Cc to GPs only:

Discharged To:

Discharged On: 25/03/2020 15:47

Discharged From:

Please document in the discharge summary the official date and time of death.

When you print out the hospital discharge summary please select to **print it out ONE SIDED** only. This is because multiple copies will be printed and if it is printed double-sided then in an uneven paged document the first page of the second copy will be printed on the back of the last page of the first copy. The simplest work-around is to print this out single-sided.

Coroner's Cases

Not all deaths after medical interventions need to be reported. If the death is medically expected then the coroner will be happy that an MCCD is completed. If in doubt please discuss with the consultant who may direct you to discuss with the coroner.

Email or fax the Hospital Record of Death Form to the National Initial Investigation Office (NIIO)

If coroner accepts jurisdiction then notify the police. The phone number is on the back of the Mortality Paperwork Checklist. The family should be informed that the coroner is taking jurisdiction and they should remain close-by until the police have been and identified the deceased with them.

Verification of Death

VERIFICATION OF DEATH
Completion of this form is not required when a doctor completes a Medical Certificate of Cause of Death (MCCD)

I declare that I examined the body of:

Person's Name:	
On (date):	At (time):
Location of examination of body:	

and I confirm that this person is dead.

In reaching this conclusion I relied upon one of the following assessments:

(a) The condition of the body, as detailed below – (At least ONE box must be ticked to confirm death)

<input type="checkbox"/>	The body showed signs of rigor mortis incompatible with life; or
<input type="checkbox"/>	The body had visible traumatic injuries incompatible with life; or
<input type="checkbox"/>	The body showed signs of decomposition incompatible with life

OR

(b) A clinical assessment, as detailed below – (ALL assessments must be ticked to confirm death)

First Assessment	(minimum 15 minutes between)	Second Assessment
<input type="checkbox"/>	No signs of breathing for 1 minute	<input type="checkbox"/>
<input type="checkbox"/>	No palpable central pulse (carotid or femoral or brachial)	<input type="checkbox"/>
<input type="checkbox"/>	No audible heart sounds	<input type="checkbox"/>
<input type="checkbox"/>	Pupils dilated and unresponsive to light	<input type="checkbox"/>

Optional additional assessment (if a defibrillator is present) –

<input type="checkbox"/>	Cardiac rhythm asystole on defibrillator monitor
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OR

(c) Testing for brain death –

<input type="checkbox"/>	Certified brain dead in accordance with the ANZICS Guidelines
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Signature of person making declaration:	Reg No. or Identifier or Employee No.
Name (please print):	

Name of Employer or Medical Practitioner:

Practitioner Scope:	<input type="checkbox"/> Registered Medical Practitioner	<input type="checkbox"/> Intensive Care Paramedic
	<input type="checkbox"/> Nurse – Practitioner / Registered / Enrolled	<input type="checkbox"/> Paramedic
	<input type="checkbox"/> Registered Midwife	<input type="checkbox"/> Emergency Medical Technician

Only persons falling within one of the above practitioner scopes can sign this declaration.

Version 2 Reviewed March 2016 capitalDocs ID 1.103505 issued to capitalDocs April 2018

The verification of death form must be filled out for all coronial cases. This should be in addition to the documentation of life extinct in the body of the clinical notes.

Police

The police act as agents to the coroner and will attend the hospital in the case of all coronial deaths. They will identify the deceased with the family and they may also ask to speak to the medical team for information related to the death. They will write down what you have said and you may be asked to sign the bottom of their note pad. You are not obliged to sign this and we would encourage you NOT to. You can politely decline and say that if the coroner wants an official statement then they can request it. You can state that all the medical notes and information will be made available for the coroner's investigation.

Medical Certificates of Cause of Death

This is a document that will go to the Ministry of Health to be coded and provide statistics for NZ's causes of death. The deaths are coded using WHO ICD-10 codes and the more information that can be provided the easier it will be for the coders to accurately code the death. We would recommend discussing what to put on the MCCD with the consultant. If there is some uncertainty it is okay to put what is felt to be more-probable-than-not their cause of death. The sequence is:

- 1a** is the immediate cause of death
- 1b** is the antecedent cause of 1a
- 1c** is the antecedent cause of 1b
- 2** Significant conditions contributing to the death but not related to the disease or condition causing death.

These can be as descriptive as you like but the sequence of events from 1C -> 1A must make sense and must also be sequential in time (ie 1c can't be of a shorter duration than 1b and 1b can't be of a shorter duration than 1a). If more than one thing is felt to have led to the death equally, then these can be separated by a comma.

If the patient has had surgery then this should be mentioned somewhere in the certificate even if it wasn't the underlying cause of the death. It can be mentioned in Part 2.

Modes of death are not allowed (eg respiratory failure, cardiac arrest) UNLESS there is an antecedent cause listed.



Medical Certificate for Cause of Death Examples

These are some examples of MCCDs which may be useful to reference. This is not an exhaustive list and the information should be accurate to the deceased you are completing the certificate for.

Out of hospital cardiac arrest with HIE

1a	Hypoxic ischaemic encephalopathy after being resuscitated from an out of hospital cardiac arrest	Days
1b	Anterior ST elevation myocardial infarction	Days
1c	Hypertensive atherosclerotic cardiovascular disease	Years

2	Type 2 Diabetes Mellitus, obesity, hypertension, hyperlipidaemia, tobacco smoking	Years
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1a	Hypoxic ischaemic encephalopathy following out of hospital cardiac arrest due to ventricular fibrillation	Days
1b	Alcohol related dilated cardiomyopathy	Years
1c	Alcohol excess	Years

2		
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Tip: If the underlying cause of a cardiomyopathy is known then this should be stated. If there are multiple contributory causes these can be separated by a comma and the time frames can be placed in brackets beside

Intracranial haemorrhages

1a	Complications of aneurysmal subarachnoid haemorrhage	Days
1b	Left middle cerebral artery aneurysm	Unknown
1c		

2	Hypertension	
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Tip: be as accurate as you can about the location of the aneurysm.

1a	Left basal ganglia intraparenchymal intracranial haemorrhage	Days
1b	Essential hypertension	Years
1c		

2		
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Medically expected complications of surgery

1a	Ischaemic bowel due to cardiogenic shock (or biventricular failure) complicating mitral valve replacement surgery	Days
1b	Prosthetic mitral valve endocarditis with Staphylococcus aureus	Days - weeks
1c		
2	Previous mitral valve replacement for myxomatous mitral valve disease with severe mitral regurgitation	Years

Malignancies

1a	Intracerebral haemorrhage into a left frontal metastatic melanoma brain tumour	Hours
1b	Melanoma with metastases to liver, brain and lung	Months
1c		
2		

1a	Multi-organ failure secondary to intra-abdominal sepsis from a sigmoid colon perforation with attempted surgical treatment	24 hours
1b	Metastatic colon cancer with sigmoid primary and pulmonary metastases	Months
1c		
2		

Tip: be specific about the type and anatomical location of cancer (this may require looking at the oncologist clinic letters). The more detail about the type and grade of cancer and its primary location and location of metastases the better.

Haematological malignancies

1a	Idiopathic pneumonia syndrome	Days
1b	Allogenic stem cell transplantation and immunosuppression	47 days
1c	High risk B cell lymphoblastic leukaemia with KMT2A rearrangement	7 months
2	Pancolitis and mucositis complicating chemotherapy and whole body irradiation for stem cell transplant- (2 months)	

Tip: If a patient has undergone a stem cell transplant and died of complications from this then the exact number of days from transplantation will be known. The haematology team may wish to advise on what to state on MCCDs for their patients.

Be specific about the type of haematological malignancy the patient had and the timeframes involved.

Pancreatitis

1a	Complications of necrotising pancreatitis	Months
1b	Gallstones	Unknown
1c		
2	Type 2 Diabetes, ischaemic heart disease	

Tip: the underlying cause of the pancreatitis should be stated. If the duration of an underlying condition is unknown – it is acceptable to state that.

Genetic conditions

1a	Infective exacerbation of bronchiectasis with multiresistant <i>Pseudomonas aeruginosa</i>	Days
1b	Cystic fibrosis	Lifelong
1c		
2		

Tip: if the bacteria is known then that should be stated. Genetic conditions should be listed as 'lifelong' for their duration.

Complications related to events in the distant past

1a	Ischaemic small and large bowel complicating a reversal of Hartmann's procedure	11 days
1b	Hartmann's procedure for a colovaginal fistula complicating pelvic fractures sustained in a motor vehicle crash	2.5 years
1c		

2	Frailty, osteoporosis (years)	
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1a	Pulmonary embolism	Hours
1b	Immobility due to C7 tetraplegia	10 years
1c	Tetraplegia following a C7 cervical spine fracture after diving into a shallow pool	10 years

2		
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Tip: the distant past event is only relevant if it set off the chain of events that led to the person's death

Immunosuppression

1a	Septic shock and multiorgan failure from Group A Streptococcus soft tissue infection of the left axilla	5 days
1b	Immunosuppression on methotrexate and adalimumab	Years
1c	Ankylosing Spondylitis	Years

2		
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More than one contributing factor

1a	Perioperative acute coronary syndrome following a below knee amputation for right lower limb gangrene	Days
1b	Ischaemic heart disease, peripheral vascular disease	Years
1c	Coronary and Peripheral artery atherosclerosis	Years

2		
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