Policy Directive

Critical Care Tertiary Referral Networks and Transfer of Care (ADULTS)

Summary This Policy Directive refers to critically ill or injured adult patients and those at risk of critical deterioration requiring referral and transfer of care to a higher level facility. The policy defines the links between Local Health Districts (LHDs) and tertiary referral hospitals and takes into account established functional clinical referral relationships. The policy outlines the roles of state clinical specialty referral networks that operate in conjunction with the NSW Critical Care Tertiary Referral Networks.

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Audience Critical Care Staff, Intensive Care Units, Emergency Departments, Aeromedical Retrieval Services, NSW Ambulance, Patient Flow Units, Patient Flow Managers, After Hours Managers, Transport Staff

Secretary, NSW Health

This Policy Directive may be varied, withdrawn or replaced at any time. Compliance with this directive is mandatory for NSW Health and is a condition of subsidy for public health organisations.

NSW GOVERNMENT Health
POLICY STATEMENT

NSW CRITICAL CARE TERTIARY REFERRAL NETWORKS AND TRANSFER OF CARE (ADULTS)

PURPOSE

This Policy Directive refers to critically ill or injured adult patients and those **at risk of critical deterioration** requiring referral and transfer of care to a higher level facility.

The policy defines the links between Local Health Districts (LHDs) and tertiary referral hospitals and takes into account established functional clinical referral relationships.

The policy outlines the roles of state clinical specialty referral networks that operate in conjunction with the NSW Critical Care Tertiary Referral Networks (Section 10). It describes the process for time urgent and non-time urgent patients, referral process for retrieval services, the default adult intensive care unit (ICU) bed policy and the requirement for LHD escalation processes.

MANDATORY REQUIREMENTS

- Access to emergency care and/or surgical intervention for time urgent critically ill or injured patients must not be delayed due to "no-available" ICU or specialty bed e.g. burns, cardiac or spinal. Should this situation arise Aeromedical Control Centre (ACC) is to be contacted immediately.
- Requirements for transfer of critically ill obese patients outlined in Section 6 must be applied.
- Each LHD must have documented and implemented escalation plans to ensure the appropriate accommodation of critically ill or injured patients. This should include procedures for clinicians to obtain timely clinical advice and/or support to expedite the review and referral of non-time urgent critical patients (Section 8). Escalation plans must also include procedures for clinicians to follow in instances where an appropriate bed is not available within the network or difficulties are experienced with patient acceptance and placement.
- Every hospital is linked to a designated tertiary referral hospital which is networked to a group of referring hospitals to provide critical care for their patients. In situations where no adult intensive care beds are available across NSW, the default adult ICU bed policy may be invoked (Section 12). When the default policy is invoked the designated tertiary hospital is responsible for providing critical care, irrespective of bed status, to a specified group of referral hospitals. This responsibility includes assisting with patient placement to an appropriate alternative location for treatment and care.
- In time urgent situations the ACC has the authority to transport the patient directly to the designated tertiary hospital regardless of available bed state. If there is a closer hospital that can provide the time urgent treatment required, ACC may elect to transport the patient there. This may include referral across LHD boundaries. In each case the ACC Consultant must notify the receiving clinician.

IMPLEMENTATION

Local Health District Chief Executives are responsible for:

- Ensuring implementation of the policy directive and the delegation of a single point of arbitration and decision making to ensure clinically appropriate transfers in appropriate timeframes.
- Meeting the critical care and intensive care needs of that LHD and linked rural LHD, where specified. This includes the provision of clinical advice and ensuring access to appropriate treatment.
- Ensuring clinical advice and/or support, escalation and referral procedures are documented and implemented to ensure access to definitive care in an appropriate timeframe.
- Ensuring that all options for placement of the critically ill patient within the originating LHD have been explored. This includes appropriate transfers from ICUs within the LHD to inpatient areas to create capacity.
- Ensuring the continued effective operation of the NSW Critical Care Tertiary Referral Network.
- Ensuring formalised intra and inter-LHD referral and/or cross jurisdictional arrangements exist for critically ill or injured patients needing a higher level of definitive care and include ongoing formal communication with review and feedback.
- Engaging relevant clinicians and ensuring that consistent local protocols or operating procedures are developed and distributed to relevant clinical areas.
- Ensuring that compliance with this policy is audited and regularly monitored in collaboration with intra and inter-LHD stakeholders.

Intensive Care Units are responsible for:

- Ensuring the information in the Critical Care Resource management System (CCRS) or Patient Flow Portal (PFP) is current and correct at each shift handover.
- Bed finding for non-time urgent critically ill or injured patients

Patient Flow Units/Bed/ After Hours Managers are responsible for:

- Facilitating referrals for all non-time urgent critically ill patients.

The NSW Aeromedical Control Centre (ACC) (**1800 650 004)** is responsible for:

- Coordination of adult medical retrieval for time urgent critically ill patients in collaboration with the Regional Retrieval Services across NSW.

NSW GOVERNMENT Health
POLICY STATEMENT

REVISION HISTORY

Version	Approved by	Amendment notes
March 2018 (PD2018_011)	Deputy Secretary, System Purchasing and Performance	Clearly defined processes for time and non-time urgent patients, responsibilities of designated tertiary hospitals and LHDs
March 2010 (PD2010_021)	Director General	Complete revision of PD2006_046 and replaces PD2005_473 Helicopter Transport of Patients - Procedures to be Followed
July 2006 (PD2006_046)	Director General	New Policy

ATTACHMENTS

1. NSW Critical Care Tertiary Referral Networks and Transfer of Care (Adults): Procedures

NSW Critical Care Tertiary Referral Networks and Transfer of Care (ADULTS)

NSW GOVERNMENT Health

PROCEDURES

Issue date: March 2018

PD2018_011

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1 Background

1.1 About this document

This policy directive provides guidance on the appropriate process for referring and transferring critically ill or injured adult patients to a higher level facility for definitive care.

Patients who are critically ill, injured or at risk of critical deterioration need appropriate access to critical care resources. In order to achieve safe, timely and efficient transfer of these patients to a higher level facility a streamlined process must exist. This document aims to support a seamless and integrated network of critical care services to best meet the needs of patients.

State clinical specialty referral networks operate in conjunction with the critical care networks.

These networks assist in ensuring appropriate and timely patient referral and transfer. Once critical care resources are no longer required by the patient a similarly efficient return transfer to the originating hospital is essential.

The Critical Care Resource management System (CCRS) provides information about available adult critical care beds across NSW. CCRS should be used to inform coordination and placement of critically ill patients to the appropriate higher level facility.

The Aeromedical Control Centre (ACC) is responsible for the statewide coordination of adult medical retrieval services for time urgent critically ill or injured patients in collaboration with the Regional Retrieval Services. The ACC is the central point of contact for the medical retrieval of all time urgent critically ill or injured adult patients.

Each Local Health District (LHD) is responsible for ensuring that escalation plans are in place to ensure clinicians can obtain timely clinical advice and/or support to expedite the review, referral and appropriate placement of critically ill or injured patients. This must include procedures for clinicians to follow for referral of non-time urgent critically ill patients in situations where there are no appropriate beds and negotiation with the receiving hospital is required (Appendix 2).

Implementation of local models, such as the Greater Western Critical Care Advisory Service (CCAS), should be considered to provide critical care specialist advice and support when required.

This policy does not include referral of paediatric, neonatal, obstetric or patients requiring specialist care and does not override referral networks established within the following policy directives:

- Critical Care Tertiary Referral Networks (Paediatrics) PD 2010_030 [1]
- Critical Care Tertiary Referral Networks (Perinatal) PD 2010_069 [2]
- Inter-facility Transfer Process for Adults Requiring Specialist Care PD2011_031[5]

Table 1 provides a summary of the referral process, contact pathways and responsibilities for time urgent and non-time urgent critically ill patients.

Table 1: Referral Process Summary

Referral Process Summary					
Clinical Condition	**Urgency of Transfer**	**Contact**	**Bed finding responsibility**	**Initiating Transport**	**Transfer to**
Critically ill or injured	**Time urgent** Fastest response and or transport by appropriate team (often medical retrieval team)	ACC [1] Advice for stabilisation and transfer	ACC[1] Patient automatically transported to nearest hospital that can provide definitive care without delay Hospital acceptance or available bed is desirable but not mandatory NB: Communication **must** occur with the receiving hospital prior to transfer	ACC [1]	Linked Tertiary Hospital
	Non-time urgent Response and or transport by appropriate team within appropriate timeframe (often medical retrieval team)	Linked Tertiary Hospital for ICU advice	Linked Tertiary Hospital using CCRS[2]/PFP and PFU[3]/hospital bed manager	Referring clinician contact ACC[1]	Linked Tertiary Hospital
Require Specialist Care	Refer to Inter-facility Transfer Process for Adults Requiring Specialist Care PD2011_031[5]				

[1] **Aeromedical Control Centre (ACC) 1800 650 004**
[2] Critical Care Resource management System (CCRS) http://ccrs.health.nsw.gov.au
[3] Patient Flow Unit (PFU) and Hospital Bed managers cannot refuse transfer of time urgent critically ill patients

Aeromedical Control Centre (ACC) 1800 650 004
Early notification = early assistance
(In emergencies notification can occur prior to full patient assessment and investigation)

1.2 Key definitions

Aeromedical Control Centre (ACC): A NSW Ambulance unit providing clinical support and advice, transport and escort services for critically ill or injured patients requiring medical retrieval.

Conference call: "One phone call" referral where possible to connect the referring clinician, medical retrieval consultant and receiving clinician.

Critical Care Resource management System (CCRS): provides information about available adult critical care beds across NSW to inform coordination and placement of critically ill patients to the appropriate level of definitive care.

Critically ill/injured: A patient whose illness, injuries or physiologic instability constitutes a significant and imminent threat to their life without appropriate resuscitation and support. Patients may be classified as:

- **Time urgent:** Requiring emergency care at the closest appropriate hospital in the shortest time possible to achieve early intervention and stabilisation.
- **Non-time urgent:** Stabilised requiring transfer for a higher level of definitive critical care or clinical specialty, but whose transfer is not time-urgent.

Patient at risk of critical deterioration: A patient who has suffered a significant injury or illness who may appear to be stable but whose condition may quickly deteriorate requiring constant monitoring and early transfer for definitive critical care.

Non-critical patient requiring specialist definitive care: A patient requiring referral and transfer for specialist care facilitated by the LHD Patient Flow Unit in consultation with the patient's clinical management team.

Escalation process: Defined procedure for escalation for decision making, when an issue regarding patient transfer arises which will impact on the patient accessing safe and timely care within the medically agreed timeframe.

Major Trauma Service (MTS): Can provide the full spectrum of care for major and moderately injured trauma patients.

Neonatal and paediatric Emergency Transport Service (NETS): A medical retrieval service for babies and children who require intensive care.

Patient Flow Portal (PFP): Electronic system which aims to improve patient flow within a ward, hospital or LHD.

Patient Flow Unit (PFU): Responsible for managing patient flow within a given facility or LHD. In rural areas this may be a bed or after hours manager.

Primary Retrieval: A patient transferred directly from the scene of an incident or medical emergency to hospital.

Regional Trauma Service (RTS): Can provide all aspects of care to patients with moderate to minor trauma, and definitive care to a limited number of major trauma patients in collaboration with the MTS.

Secondary Retrieval: A patient transferred between health facilities.

2 NSW Critical Care Tertiary Referral Networks (Adults)

The NSW adult Critical Care Tertiary Referral Networks define the links between LHDs and tertiary referral hospitals. The networks take into account established clinical referral relationships which may include referral patterns across LHD boundaries and cross jurisdictional border arrangements. In addition, some ICUs may have functional links with a higher level ICU in a networked approach to provide access to senior critical care advice under the Intensive Care Service Model.[3]

It is not the intention of this policy directive to specify each individual hospital's referral pathways. The referral pathways defined within this document are the established links and the **default** patterns to be used when the default adult ICU bed policy is invoked (Section 12).

Operating in conjunction with the critical care referral networks are state clinical specialty referral networks, which are also defined within this Policy Directive. These referral networks and processes are in place to assist clinicians and Patient Flow Units (PFU) to ensure appropriate and timely referrals. These include:

- NSW Burn Injury Service (Adult)
- NSW Acute Spinal Cord Injury Service (Adult)
- NSW Major Trauma Referrals (Adult)
- NSW Rural Cardiac Catheterisation Services (Adult)
- NSW Extra Corporeal Membrane Oxygenation (ECMO) Medical Retrieval

Table 2 outlines the Critical Care Tertiary Referral Networks for critically ill adult patients requiring transfer to a tertiary facility. These are also the default network for private hospitals within LHDs. Due to proximity some LHDs may also have cross jurisdictional border networks with tertiary critical care services in other states and territories, as outlined below.

Table 2: NSW Adult Critical Care Tertiary Referral Network

Referring LHD	Receiving Tertiary Hospital
Central Coast	Royal North Shore
Far West	Royal Prince Alfred, South Australia (Adelaide)[1]
Hunter New England	John Hunter
Illawarra Shoalhaven	St George
Mid North Coast	John Hunter, Queensland[3]
Murrumbidgee	ACT[2] (Canberra), Prince of Wales, St George, St Vincent's, Victoria
Nepean Blue Mountains	Nepean
Northern NSW	John Hunter, Queensland[3]
Northern Sydney	Royal North Shore
South Eastern Sydney	Prince of Wales, St George
South Western Sydney	Liverpool
Southern NSW	ACT (Canberra)[2], Prince of Wales, St George
Sydney	Royal Prince Alfred
Western NSW	Royal Prince Alfred
Western Sydney	Westmead

Due to proximity some LHDs and facilities also maintain clinical referral networks as follows:

- Far West: South Australia[1].
- Murrumbidgee: ACT [2] (Batlow, Boorowa, Murrumbarrah-Harden, Tumut, Young), Victoria [4] (Albury)
- Mid North Coast: Queensland [3].
- Northern NSW: Queensland [3] (Tweed)
- Southern NSW: ACT[2] (Bateman's Bay, Bombala, Boorowa, Braidwood, Crookwell, Cooma, Delegate, Goulburn, Moruya, Pambula, Queanbeyan South East Regional (Bega) and Yass)

3 Which Adults May Need Medical Retrieval?

Patients with actual *or* ***potential*** **significant illness or injuries who are at risk of critical deterioration** and **may** require retrieval in the event that the originating hospital is unable to safely continue care include:

Airway	• All intubated patients • Patients potentially requiring airway intervention enroute (threatened airway obstruction, altered or decreasing LOC, head/neck trauma, head/neck / inhalation burns)
Breathing	• Significant respiratory distress or compromise after treatment • RR < 8 or >30, SpO_2 < 90% on 15L oxygen • $Pa02$ <60 or $PaC02$ >60 or pH < 7.2 or BE <-5 • Respiratory dependency on NIV
Circulation	• Circulatory shock of any cause • Heart rate < 40 or > 140 beats per minute with compromise • SBP ≤ 90mmHg • Complex or recurrent arrhythmias with compromise (e.g. recurrent VF, sustained VT, CHB) • Ongoing significant bleeding
Disability	• Significant altered LOC - GCS ≤ 13 • Significant head injury • Severe burns • Acute spinal cord injuries • Recurrent or prolonged seizures • Intracerebral bleeding
Other	• Acute life-threatening electrolyte abnormality

Note: This list does not necessarily indicate time urgent, but is a list of patients who may need physician-escorted retrieval.

4 NSW Aeromedical Control Centre (ACC)

The Aeromedical Control Centre (ACC) is a unit of NSW Ambulance which provides statewide 24-hour coordination and support:

- For **time urgent** critically ill or injured patients, the ACC will provide critical care clinical advice from a critical care consultant, location of and referral to an appropriate receiving hospital and mobilise a medical retrieval team (Section 7).
- For non-time urgent critically ill or injured patients, the ACC will organise and mobilise an appropriate clinical team (usually physician escort) (Section 8).
- The ACC will coordinate and mobilise an appropriate medical retrieval team for all medical retrievals (from both public and private facilities, to public facilities).
- Where possible; the ACC will coordinate a one phone call referral via conference call to connect the referring clinician, retrieval consultant and receiving clinician. The

ACC and regional Ambulance Control Centres monitor all 000 calls for mechanisms and injuries suggestive of severe trauma, and dispatch appropriate retrieval teams (usually Doctor/paramedic) where indicated.

- The medical retrieval team can provide a variety of interventions including; advanced airway management, chest trauma management, advanced vascular access, transfusions, compression of bleeding sites and some time urgent surgical procedures where no viable alternative exists.

The ACC is **not** responsible for coordinating the transfer of non-critically ill patients. These patients must be managed by the LHD as per Section 9.

5 Key Elements of the Medical Retrieval System

- The ACC provides statewide coordination of adult medical retrieval services, in collaboration with the regional retrieval services.
- Retrievals may be undertaken by road, fixed wing aircraft or helicopter. Vehicle choice is based on the clinical urgency, transport requirements, optimum transport team, vehicle utilisation and available resources.
- All retrieval services can transport critically ill or injured patients by road ambulance using appropriate advanced medical equipment and clinical staff. An overview of adult retrieval services can be found at Table 3.
- Fixed wing aircraft and helicopters are not capable of safe flight in adverse weather conditions. The ACC uses a protocol to balance clinical priority and aviation risk. Factors such as fatigue, darkness and cold temperatures (fog, icing) increase aviation risk. Therefore, non-urgent transfers are not usually undertaken between midnight and 0700hrs.
- Aviation factors may influence the destination hospital and in some cases alternatives such as long road transfers, with or without an appropriate medical retrieval team, may be necessary.
- Critically ill or injured patients must be transferred to the nearest (in-time) designated appropriate facility (e.g. Major Trauma Service), irrespective of ICU bed status, so that emergency stabilisation and treatment can commence with minimal delay.
- In some cases, the referring clinician, retrieval consultant and receiving clinician may decide to refer a patient to a different hospital which is considered more clinically appropriate for that patient's definitive care.
- Ultimate responsibility for vehicle and team choice rests with the ACC retrieval consultant, with input from relevant stakeholders. Where there is a difference in clinical opinion regarding the appropriateness of the transfer, the final decision will be made by the ACC. This will follow a conference call between the referring clinician, retrieval consultant and receiving clinician, as per retrieval resources (Appendices 5-7).

Table 3: Overview of adult aeromedical retrieval services

Overview of adult medical retrieval services							
Aircraft	**Location**	**Uses**	**Number of aircraft**	**Patient capacity**	**Bariatric capacity Max**	**IABP transfers**	**ECMO transfers**
Fixed Wing	**Broken Hill** (Royal Flying Doctor Service)	Inter hospital transfer Primary mission Outreach clinic service	1	1 -2	230kg	Fixed wing and helicopters are capable of IABP and ECMO transfer Originate from Sydney and require specialist medical staff and equipment	
	Dubbo (Royal Flying Doctor Service)	Inter hospital transfer	1	1 -2			
	Sydney (Bankstown)	Inter hospital transfer	4	1 -2			
Helicopter	**Sydney** (Bankstown)	Primary mission	3	1 critically ill 2 in some cases	130kg[1] / 200kg		
	Lismore	Retrieval	1				
	Tamworth		1				
	Newcastle (JHH)	Search & rescue	1				
	Orange	Water Rescue	1				
	Wollongong		1				
	Canberra		1				

[1] Standard helicopter stretcher capacity is 130kg. Patients exceeding this need a 200kg stretcher and the ACC **must** be advised of this need in advance. Other requirements outlined in section 6 must also be met.

6 Obese Patients

The transfer of critically ill or injured obese patients can be clinically and logistically challenging. Different vehicles and stretchers are used to transport obese patients and limitations in weight capacity need to be considered including:

- The weight the stretcher, loading and securing mechanisms, and vehicle floor can support
- The stretcher width and whether the patient can physically fit and be restrained safely.

The transfer of obese patients by any vehicle is usually much slower than normal transfers. Occasionally the retrieval may occur in two separate stages; with rapid dispatch of clinical retrieval staff to aid in resuscitation the first step, followed by transport to definitive care.

Prior to commencing retrieval of any patient above 110kg, an **accurate** weight and maximum measured width must be determined, as per Bariatric Sizing Chart (Appendix 5). **Hospitals must ensure they can weigh patients**, as an estimate is unacceptable and may result in delays as alternative vehicles, stretchers and restraint systems are sourced.

In addition to the patient's weight and measurement, any logistical issues and resource requirements such as sufficient personnel, equipment and facilities to transport the patient to and into the vehicle must be considered, as per Table 4. Lack of resources may delay or negate the possibility of transfer or necessitate road transfer irrespective of distance.

At the time of retrieval request, the above information must be communicated to the ACC to help determine the most appropriate mode of transport.

The NSW Health Guideline GL2005_070 "*Occupational Health & Safety Issues Associated with Management of Bariatric (Severely Obese) Patients*"[4] should be referred to for the management of obese patients.

Table 4: Retrieval transport modes and resource considerations

Vehicle type	Road	Road Multi Purpose Vehicles (MPVs)	Fixed wing	Helicopter
Maximum weight	200kg	Any weight and size	230kg	130kg - normal stretcher 230kg - bariatric stretcher (must be added **before** leaving base)
Considerations	Patient width	Limited number of vehicles May not be available in suitable timeframe, depending on patient location	Can road legs to / from airports accommodate patient weight	Onsite concrete helipad Flat paved pathways into/out of hospital
Resources	Sufficient personnel Equipment and facilities to transport patient to and into vehicle: • Manual handling aides • Height adjustable trolley (as per below)			
Hospital trolley	Minimum safe working load	300kg		
	Height adjustable	660mm to 1020mm above ground level		
	Patient platform length	2 metres- with no raised edging at one end		
	Patient platform width	700mm		
	Patient platform surface	Smooth with raised edges on both sides and one end		
	Patient restraint system	Must have		
	Large wheels	Suitable for manoeuvring from hospital to helipad		
Bariatric chart	Complete and return to ACC as soon as possible			
Contact ACC	Provide weight, measurement and logistical considerations as soon as possible to inform transport mode			

[1] Standard helicopter stretcher capacity is 130kg. Patients exceeding this need a 200kg stretcher and the ACC must be advised of this in advance.

7 Time Urgent Patients Requiring Critical Care Referral

The ACC should be the first point of contact for all time-urgent critically ill or injured patient referrals, as per Appendix 1. PFUs should **not** be the first point of contact.

The ACC will provide critical care clinical advice, referral to the appropriate linked tertiary hospital consultant, bed finding and patient transfer for **time urgent** critically ill or injured patients from public and private facilities to public facilities.

Some examples of time-urgent patients include; traumatic head injury requiring urgent craniotomy, exsanguinating multi trauma patient, STEMI with cardiogenic shock, severe burns, acute spinal cord injury with motor sensory level and uncontrolled bleeding with ongoing shock after resuscitation from gastrointestinal or obstetric blood loss.

All time urgent transfers must be discussed with a retrieval consultant, even if the referring clinician believes a medical retrieval will not be the best option for the patient. There are added risks involved with transferring patients between hospitals without appropriately trained staff and properly secured medical equipment. If it is agreed that another option such as road ambulance transfer, with or without nurse or local doctor escort, is best, the retrieval consultant can organise an expedited ambulance response.

The referral process for **time urgent** critically ill or injured patients is:

- Referring clinician to contact ACC and, where possible, a conference call will be established; between the referring clinician, retrieval consultant and receiving clinician at the linked tertiary hospital.
- If a closer hospital can provide the time urgent treatment, the ACC may elect to transport the patient there. In each case the retrieval consultant will notify the receiving clinician.
- Clinical and logistical advice will be provided to the referring clinician to support the stabilisation and resuscitation of the patient.
- The timing of transfer will be triaged and coordinated by the ACC within the context of competing priorities.
- The ACC is responsible for providing timely updates to the referring clinician on dispatch and estimated time of arrival of the medical retrieval team.
- The referring clinician is responsible for ensuring:
  - Specific information regarding the patient's clinical status, management and any special considerations such as weight or logistical issues are provided to the ACC.
  - Timely updates of any significant changes in the patient's condition are provided to the ACC.
- The referring and receiving hospitals are responsible for notifying their PFU/hospital bed or after hour's managers of the impending transfer. However, PFU/ hospital bed or after hours managers **cannot** refuse transfer of time urgent critically ill or injured patients.

The ACC can be contacted on: 1800 650 004.

Retrieval resources including the bariatric sizing chart as per Appendices 5-8.

8 Non-Time Urgent Patients Requiring Critical Care Referral

The LHD is responsible for providing 24/7 mechanisms for critical care clinical advice, location of an appropriate receiving hospital and bed (which may be outside the LHD). Established LHD processes are usually via a critical care consultant attached to the linked tertiary hospital or PFU and the Critical Care Resource management System.

The ACC retrieval consultant is available to supplement clinical advice and task an appropriate clinical team to effect the transfer.

Some examples of non-time urgent patients include; ventilated and stable drug overdose, patients ventilated for respiratory failure who do not require an urgent life-saving procedure, stable ventilated multi trauma patients that have been appropriately imaged and do not require urgent surgery or intervention.

The ACC should be contacted as soon as possible and advised of the impending retrieval as outlined in Appendix 1. However, the role of ACC does **not** extend to locating beds or facilitating clinical referral for critically ill or injured patients who are **non-time urgent**. This remains the responsibility of the LHD, regardless of whether the linked tertiary hospital or LHD can provide an appropriate bed themselves.

Communication must occur with the receiving hospital prior to transfer. Once the patient has been accepted at the receiving hospital then ACC should be contacted to undertake the retrieval.

The referral process for **non-time urgent** critically ill or injured patients is:

- Referring clinician to contact their LHD's nominated central point for critical care advice such as the CCAS model with PFU attached medical officer, or linked tertiary referral hospital
- Clinical discussion to occur between referring clinician and LHD central point to determine clinical transfer priority, facilitate conference call with appropriate receiving consultant, facilitate transfer and assist with bed location as required
- Referring clinician/LHD central point to contact ACC to initiate transport and, where possible, a conference call will be established; between the referring clinician, retrieval consultant and receiving clinician
- The timing of transfer will be triaged and coordinated by the ACC and communicated within the context of competing priorities
- The referring clinician/LHD central point is responsible for ensuring communication of all relevant information to the ACC, as per Section 7
- The referring and receiving hospitals are responsible for notifying their PFU/hospital bed or after hour's managers of impending transfers.

9 Non-Critical Patients Requiring Referral for Specialist Care (Adults)

The role of ACC does **not** extend to locating beds or facilitating clinical referral for non-critical patients requiring specialist care.

Some examples of these patient types include; physiologically stable STEMI and conscious FAST-positive stroke patients requiring consideration of thrombolysis or neurointervention. All transfers must occur as per "Inter-facility Transfer Process for Adults Requiring Specialist Care" PD2011_031.

The volume of referrals and multitude of clinical referral networks for non-critical patients necessitates a decentralised model. However, it is recognised that in some cases, unless the referral and transfer is timely, the situation may become critical.

Each LHD has intra and inter LHD clinical networks for non-critical patients requiring referral for a higher level of specialist care. Formalisation of these networks and an "escalation of care" process must be in place to ensure patients who require specialist referral are afforded timely access to definitive care.

PFUs/hospital bed or after hours managers support these established networks and facilitate non-critical referrals for patients requiring a higher and/or more specialised level of definitive care. All non-critically ill patients who require time urgent treatment and inter facility referral and transfer for specialist care should be facilitated through the LHD PFU/hospital bed or after hours manager, LHD transport services and if needed NSW Ambulance.

10 Critical Care Resource Management System (CCRS)

Currently the CCRS provides information about available adult critical care beds across NSW. There are plans to include this functionality into the PFP, however until this time CCRS should be used to inform coordination and placement of critically ill patients.

The web based CCRS receives automated data feeds from the Patient Flow Portal (PFP) every fifteen minutes via the LHD Patient Administration Systems (PAS) to inform ICU bed status. Manual updates are also required in real time to ensure that information is accurate and reflective of issues which can affect bed availability, such as staff availability. CCRS can be accessed via http://ccrs.health.nsw.gov.au.

The aim of CCRS is to improve access to adult intensive care beds for critically ill patients across NSW. Where appropriate, regional critical care services should be considered as potential sites to refer critically ill patients to improve overall access to intensive care beds. Statewide networking increases the number of patients able to be managed in regional centres and cared for closer to their home and family.

The linked tertiary hospital is responsible for bed finding using CCRS. If the patient has a time urgent critical condition needing transfer in the shortest time possible ACC should be contacted as per Section 7.

Each ICU is responsible for ensuring the information in CCRS is correct and current. Each ICU is required to check and verify the unit bed status at each nursing shift handover.

11 Statewide Clinical Specialty Referral Networks

Operating in conjunction with the adult critical care referral networks are the state adult clinical specialty networks. These networks are designed to achieve appropriate concentration of highly specialised services which can respond to the needs of NSW residents.

These specialty networks are outlined in Sections 11.1-11.6 and include:

- Burns
- Spinal
- Trauma
- Cardiac Catheterisation
- Extra Corporeal Membrane Oxygenation (ECMO)

Note should be taken of the most appropriate referral facility and the ability to take combined injuries such as burns, spinal and trauma if needed.

11.1 NSW Severe Burn Injury Service Referral Network (Adult)

The NSW Adult Statewide Severe Burn Injury Service is located at Concord Repatriation General Hospital and Royal North Shore Hospital. Patients may be retrieved to either one of these, except in the following circumstances where patients should be transported directly to Royal North Shore Hospital:

- Adult with burn injury and actual or suspected severe trauma
- Adult with burn injury and acute spinal cord injury
- Adult with burn injury during 2nd and 3rd trimester pregnancy.

Patients with severe burn injury should be referred according to the "NSW Burn Transfer Guidelines NSW Burn Injury Service"[6], available at:
https://www.aci.health.nsw.gov.au/resources/burn-injury.

The Severe Burn Injury Service Referral Network defines specialist burn injury services for severe burns and networked LHDs.

Table 5: NSW State Burn Injury Service Referral Network (Adult)

NSW Severe Burn Injury Service Referral Network (Adult)	
Referring Local Health District	Receiving Severe Burn Hospital
Australian Capital Territory (ACT) Far West NSW LHD Illawarra Shoalhaven LHD Murrumbidgee LHD Nepean Blue Mountains LHD South Eastern Sydney LHD South Western Sydney LHD Southern NSW LHD Sydney LHD Western NSW LHD Western Sydney LHD	**Concord Repatriation General Hospital** • Burns Registrar/Consultant on-call Ph: (02) 9767 5000 then page • Intensive Care Unit Ph: (02) 9767 6404 • Burn Unit/Ambulatory Care Ph: (02) 9767 7775 (b/h) Ph: (02) 9767 7776 (a/h) Fax (02) 9767 5835 • Burns CNC Ph: (02) 9767 5000 then page Office (02) 9767 7798
Central Coast LHD Hunter New England LHD Mid North Coast LHD Northern NSW LHD Northern Sydney LHD	**Royal North Shore Hospital** • Burns Registrar/Consultant on-call Ph: (02) 9926 7111 then page Registrar on call. • Intensive Care Unit Ph: (02) 9463 2600 • Burns Unit/Ambulatory Care Ph: (02) 9463 2108 (b/h) Ph: (02) 9463 2111 Fax: 9463 2006 • Burns/Plastics CNC Ph: 9926 7111 then page 41731 Office (02) 9463 2102

Due to proximity some LHD and hospitals may maintain specialty referral networks interstate; **Adult Retrievals: Contact ACC 1800 650 004**

11.2 NSW State Spinal Cord Injury Referral Network (Adult)

The NSW Adult State Spinal Cord Injury Service (SSCIS) is located at Prince of Wales Hospital and Royal North Shore Hospital. Patients may be retrieved to either one of these, except patients who have combined severe trauma and acute spinal injury should be transported directly to Royal North Shore Hospital, if clinically appropriate

The SSCIS is responsible for the management of patients who have sustained an acute spinal cord injury where there is persistent neurological deficit arising from damage to neural tissue as a result of trauma, or a non-progressive disease process (e.g. transverse myelitis, vascular occlusion, compression by infective process or haemorrhage).

Trauma patients who have sustained a spinal injury with neurological deficit must be transferred to a SSCIS as soon as medically stable. The relevant SSCIS should be notified immediately in all cases where a spinal cord injury has been sustained to facilitate referral and transfer as soon as possible, and to obtain clinical management advice.

This referral process only relates to acute spinal cord injuries with neural loss and those spinal cord injuries as defined by the SSCIS. Patients with vertebral fractures only, are to

be referred to a Spinal/Orthopaedic or Neurosurgeon via the existing specialist trauma referral process for each LHD.

The State Spinal Cord Injury Referral Network defines specialist spinal services for acute spinal cord injuries and networked LHDs.

Table 6: NSW State Spinal Cord Injury Service (SSCIS) Referral Network (Adults)

NSW State Spinal Cord Injury Service (SSCIS) Referral Network (Adults)	
Referring Local Health District	Receiving Spinal Cord Injury Service
Australian Capital Territory (ACT) Illawarra Shoalhaven Murrumbidgee South Eastern Sydney Southern NSW South Western Sydney Sydney St Vincent's Health Network	**Isolated Spinal Cord Injury:** **Prince of Wales Hospital PH: (02) 9382 2222** **ASK for** - On-Call Spinal Surgical Consultant **NB:** For referrals with an acute SCI, transfer arrangements within 24 hrs. of injury will be expedited through the POWH policy of non-refusal
Central Coast Far West Hunter New England Mid North Coast Nepean Blue Mountains Northern NSW Northern Sydney Western NSW Western Sydney	**Isolated or combined severe trauma and Spinal Cord Injury:** **Royal North Shore Hospital PH: (02) 9926 7111** (For **acute** traumatic and non-traumatic SCI) **ASK for:** On-Call Spinal Surgical Consultant **Royal Rehab PH: (02) 9808 9222** (For SCI Rehabilitation)

Due to proximity some LHD/ hospitals may maintain specialty referral networks interstate.; **Adult Retrievals: Contact ACC 1800 650 004**

11.3 NSW Major Trauma Referral Networks (Adult)

The NSW adult trauma services provide expert multidisciplinary care for injured patients. The referral network for NSW trauma patients includes Regional Trauma Services (RTS) and Major Trauma Services (MTS). For patients with time urgent critical injuries, the first call should be to the ACC.

The trauma response begins with early identification of actual or potential severely injured patients by paramedics on scene or by hospital clinical staff. Transfer notification for major trauma patients should occur concurrently with treatment and imaging, and should not be delayed for want of a definitive diagnosis.

When an injured patient is initially managed at a local hospital, the hospital should expedite consultation and transfer to the networked RTS or MTS, as per trauma guidelines[7].

RTS can provide all aspects of care to moderate - minor trauma patients and definitive care to a limited number of major trauma patients, in consultation with the networked MTS. This may include transfer to a MTS for services not available at the RTS.

The MTS can provide the full spectrum of care to major - moderately injured patients.

Patients with major trauma injury should be referred according to the "NSW Major Trauma Retrieval & Transfers Consensus Guidelines - NSW Institute of Trauma and Injury Management (ITIM)", available at: https://www.aci.health.nsw.gov.au/get-involved/institute-of-trauma-and-injury-management/clinical/trauma-guidelines/Guidelines

All time urgent critically injured trauma patients must be transferred directly to the networked designated trauma service that can provide the required time urgent treatment (usually damage control surgery) prior to subsequent transfer. The ACC or regional retrieval consultant will make this decision in consultation with the referring hospital, retrieval team and receiving hospital.

If clinically appropriate, the following groups of trauma patients should be transferred directly as follows:

- **Isolated injury - acute spinal cord injury or burn injury** - to relevant service (see 11.1-11.2)
- **Combined injury -** acute spinal cord injury or burn injury and severe trauma - to Royal North Shore Hospital

All non-time urgent major trauma patients should be transferred to the nearest appropriate trauma service which may be either an RTS or MTS.

The NSW Trauma Services Referral Network defines specialist trauma services for trauma injuries and networked LHD's.

Table 7: NSW Trauma Services Referral Networks (Adult)

NSW Trauma Services Referral Networks (Adult)		
Referring Local Health District	Regional Trauma Service	Major Trauma Service
Central Coast Northern Sydney	Gosford	Royal North Shore
Far west[4] Nepean Western NSW Western Sydney	Nepean Orange	Westmead
Hunter New England Mid North Coast Northern NSW[1]	Coffs Harbour Lismore[1] Port Macquarie Tamworth Tweed[1]	John Hunter
Illawarra Shoalhaven Murrumbidgee[2 & 3] South Eastern Southern NSW[3]	Wollongong Wagga	St George Australian Capital Territory
South Western Sydney	NA	Liverpool
Sydney	NA	Royal Prince Alfred
NA	NA	St Vincent's

Due to proximity the following LHD/ hospitals maintain referral networks as follows:
1. Northern NSW - Queensland. 2. Victoria.
3. The ACT (Canberra) - Batemans Bay, Batlow, Bombala, Boorowa, Braidwood, Cooma, Crookwell, Delegate, Goulburn, Moruya, Pambula, Queanbeyan, South East Regional (Bega), Tumut, Yass and Young.
4. Broken Hill - SouthAustralia.

Adult Retrievals: **Contact ACC 1800 650 004**

11.4 NSW Rural Cardiac Catheterisation Laboratory Referrals (Adults)

Rural adult cardiac catheterisation services are located at Tamworth, Orange, Wagga Wagga, Port Macquarie, Coffs Harbour and Lismore.

Critically ill patients requiring time urgent inter-hospital transfer from a rural cardiac catheter service to a tertiary hospital for an urgent procedure (usually interventional cardiology or surgery) should be immediately transferred, regardless of bed availability as per Section 7.

The ACC should be contacted to facilitate the transfer. Where an Intra-Aortic Balloon Pump (IABP) device is required for an aeromedical transfer the ACC, must provide their own IABP device (authorized for aeromedical transport) and team (both located in Sydney).

If an IABP is not absolutely required to manage an unstable patient, referring cardiologists should consider whether the presence of the IABP is more important than the necessary delay in transfer time it will incur. The ACC consultant can advise in individual cases what the time differential is likely to be.

The Cardiac Catheterisation Laboratory Referrals (Adults) defines services and networked LHDs.

Table 8: NSW Cardiac Catheterisation Laboratory Referral Networks

NSW Cardiac Catheterisation Laboratory Referral Networks	
Referring Local Health District	Receiving Cardiac Catheterisation Service
Far West	South Australia
Hunter New England	John Hunter
Murrumbidgee	St Vincent's
Mid North Coast	Prince of Wales
Northern NSW	Lismore, Queensland
Southern NSW	Australian Capital Territory (ACT)
Western NSW	Royal Prince Alfred

Due to proximity some LHD and hospitals may maintain specialty referral networks interstate.
Some sites listed may not be operational 24/7. Sites should periodically update local information to include availability
Retrievals- Adults: Contact ACC 1800 650 004

11.5 NSW Extra Corporeal Membrane Oxygenation (ECMO) Medical Retrieval Service

ECMO therapy is used in many tertiary hospital ICUs to temporarily support patients with cardiac and/or respiratory failure. Most commonly this is post cardiothoracic surgery or

patients with refractory respiratory failure unresponsive to advanced mechanical ventilation techniques.

Patients who are in smaller hospitals with severe cardiac and/or respiratory failure may also be approaching or beyond the limits of conventional organ support (mechanical ventilation, inotropes etc.). Some of these patients are not safely transportable even by medical retrieval teams.

The NSW ECMO retrieval service enables patients in non-tertiary hospitals to receive this therapy if appropriate and be transported to a tertiary hospital for ongoing care.

ECMO is provided by either Royal Prince Alfred (RPAH) or St Vincent's Hospitals (SVH) via a roster system. The service involves collaboration between the active ECMO/ICU clinicians, medical retrieval services and NSW Ambulance. A combined ECMO and retrieval team is transported to the referring hospital with appropriate equipment to establish the patient on ECMO and transport the patient back to RPAH or SVH by helicopter, fixed wing or road vehicle.

To organise the referral and transfer of a patient requiring rescue ECMO the following steps must occur:

- Early notification of a patient potentially requiring referral for ECMO (Diagram 1)
- Initial contact to be made with ACC who will contact the active ECMO service
- A one phone call referral via conference call is used to connect the referring clinician, medical retrieval consultant and receiving ICU consultant

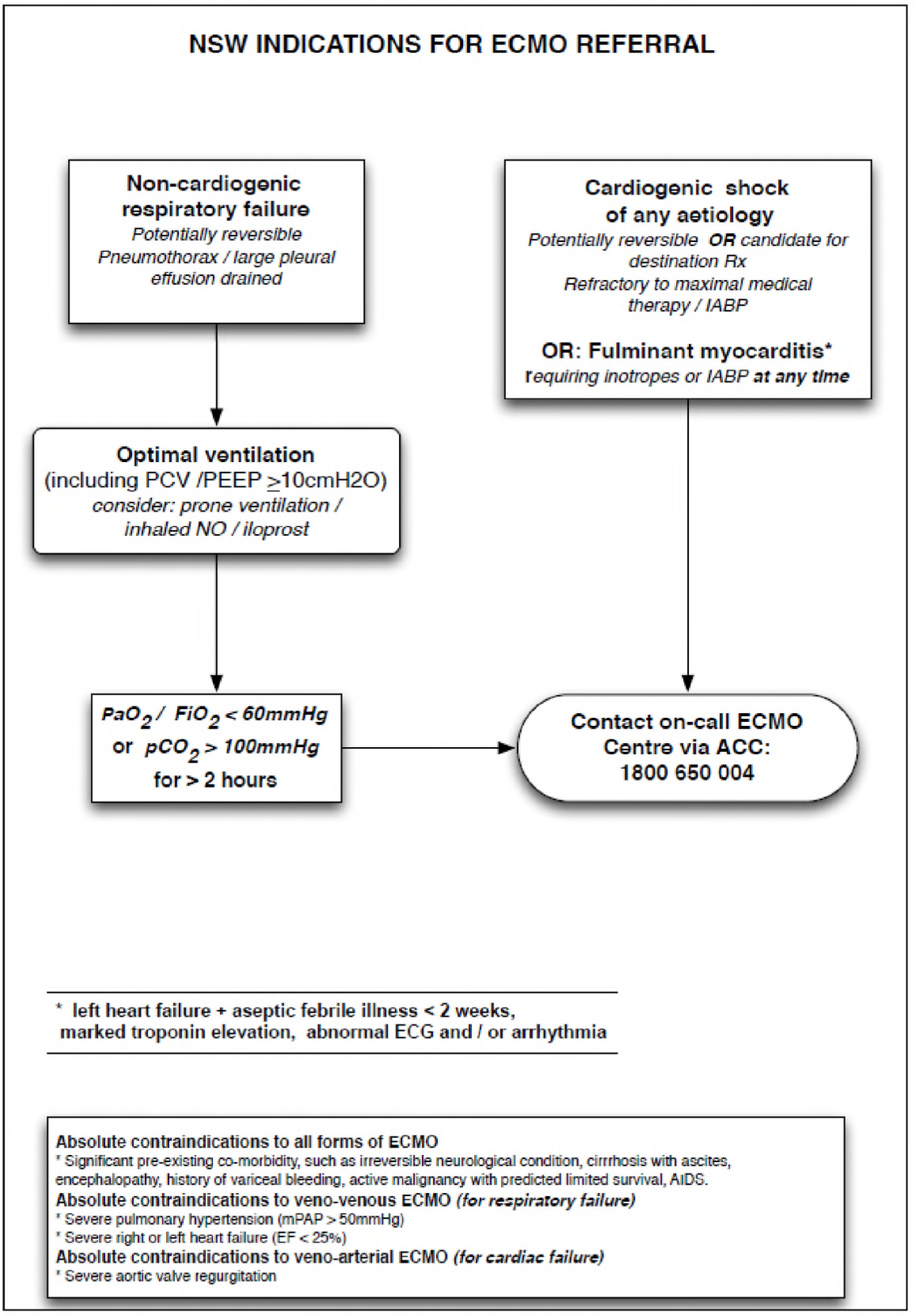
- The destination hospital will be determined according to the patients underlying condition, required clinical/surgical intervention and access to an available ICU bed.

ECMO Services	
Royal Prince Alfred Hospital	**St Vincent's Hospital**
PH: (02) 95156111 **Ask for**: ECMO intensivist on call	**PH:** (02) 83821111 **Ask for:** ICU North consultant on duty
The RPA and SVH ECMO roster is available at https://www.google.com/calendar/embed?src=7p3e1u53fvo59tkmfiok2qad6k%40group.calendar.google.com&ctz=Australia/Sydney (requires Chrome, not reliable with internet explorer)	

Retrievals- Adults: Contact ACC 1800 650 004

Case selection and treatment protocols used during ECMO are defined by the international Extracorporeal Life Support Organisation (ELSO). Diagram 1 outlines the indications for ECMO therapy and referral based on guidelines developed by ELSO and used internationally.

Diagram 1: NSW Indications for ECMO Referral



Developed based on guidelines developed by ELSO and used internationally.

11.6 NSW Paediatric, High Risk Obstetric and Perinatal Referrals

All paediatric referrals and transfers must be arranged according to the Critical Care Tertiary Referral Networks (Paediatrics) PD 2010_030 [1] and coordinated via NETS.

All high risk obstetric and perinatal transfers must be arranged according to the Critical Care Tertiary Referral Networks (Perinatal) PD 2010_069[2] and coordinated via the Pregnancy Advice Line (PAL) and NETS on 1300 36 2500.

12 NSW Default Adult ICU Bed Policy

Access to emergency care and/or urgent surgical intervention for time urgent critically ill or injured patients must not be delayed due to no-available ICU bed. The ACC should be contacted immediately for such patients.

In time urgent situations, the ACC has the authority to transport the patient directly to the linked tertiary hospital designated by the NSW Adult Critical Care Referral Network regardless of bed state. If there is a closer facility that can provide the time urgent treatment, ACC may elect to transport the patient there.

Each LHD is ultimately responsible for meeting the critical care and intensive care needs (except for super-specialty services) of that LHD and linked rural LHD, where specified. This includes the provision of clinical advice and access to appropriate treatment. In addition, each LHD has a responsibility to ensure that all options for placement of the patient within the LHD have been explored and that all appropriate transfers from ICU to inpatient wards have been made to create capacity.

The LHD Chief Executive (CE) is responsible for; ensuring formalised intra and inter LHD and/or cross jurisdictional referral arrangements exist for critically ill or injured patients needing a higher level of definitive care and for non-critically ill or injured patients requiring referral for specialist care and; that clinical referral and support processes are transparent and effectively communicated to all staff to ensure patients can access definitive care in an appropriate timeframe. The ACC may contact the CE where necessary to resolve inter-LHD and non-urgent transfers.

The NSW default adult ICU bed policy may be invoked, when there are no adult intensive care beds available across NSW for a non-urgent critical patient. This must only occur after thorough assessment of ICU capacity and intra/inter-LHD critical care referral networks to ensure all potential referral options have been exhausted.

If the NSW Default Adult ICU Bed Policy is activated, the tertiary referral hospital designated by the NSW Adult Critical Care Referral Network (will be responsible for providing critical care, irrespective of bed status, to a specified group of referral hospitals. (Table 2 and Appendix 3). This responsibility includes assisting with patient placement to an appropriate alternative location for treatment and care.

The NSW Default Adult ICU Bed Policy is based on a hospital-to-hospital network and does not necessarily follow the normal LHD Critical Care Referral Networks.

In specific cases the referring clinician, retrieval consultant and the receiving clinician may decide to refer a patient to a different hospital which is considered more clinically appropriate for the patient's definitive care.

If the default adult ICU bed policy is invoked, a phone referral via conference call, outlined in Section 4, must still occur and the receiving clinician **must** be notified as soon as possible and prior to patient arrival.

12.1 Invoking the Default Adult ICU Bed Policy:

- For time urgent patients, the ACC will contact the linked tertiary hospital, or if appropriate a closer facility, and transport the patient there, regardless of bed state.
- In all other cases, the referring hospital should contact their linked tertiary ICU. If the linked ICU does not have an available bed they are responsible for finding an alternative bed which may be within or outside of the LHD.
- All units to use their escalation policy to review exit blocked beds, liaise with the hospital executive to have them cleared and update CCRS.
- The LHD's tertiary ICU verifies that there are no appropriate available ICU beds either within or outside the LHD, with the assistance of CCRS.
- Where no appropriate available ICU bed can be identified across the system the **designated tertiary ICU** will accept the patient, irrespective of bed status.

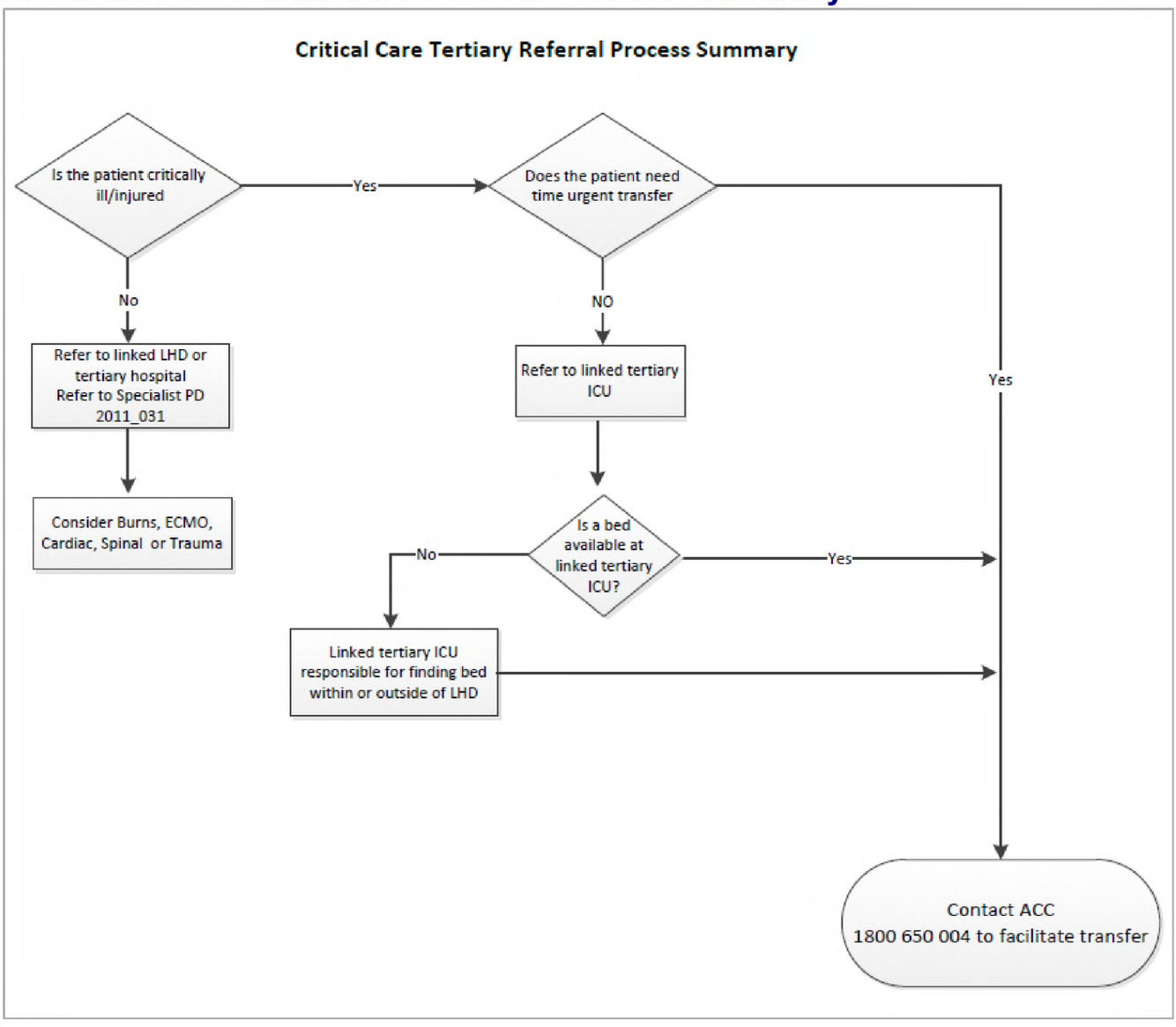
Prior to patient transfer a phone referral via conference call, outlined in Section 4, must occur and the receiving clinician must be notified as soon as possible and prior to patient arrival.

Fundamental to this procedure being activated is the principle that:

Where a patient requires time urgent critical care, not available at the referring hospital, then the patient must be transferred immediately to the facility designated by the NSW Adult Critical Care Tertiary Referral Network that is able to provide appropriate emergency treatment irrespective of bed status.

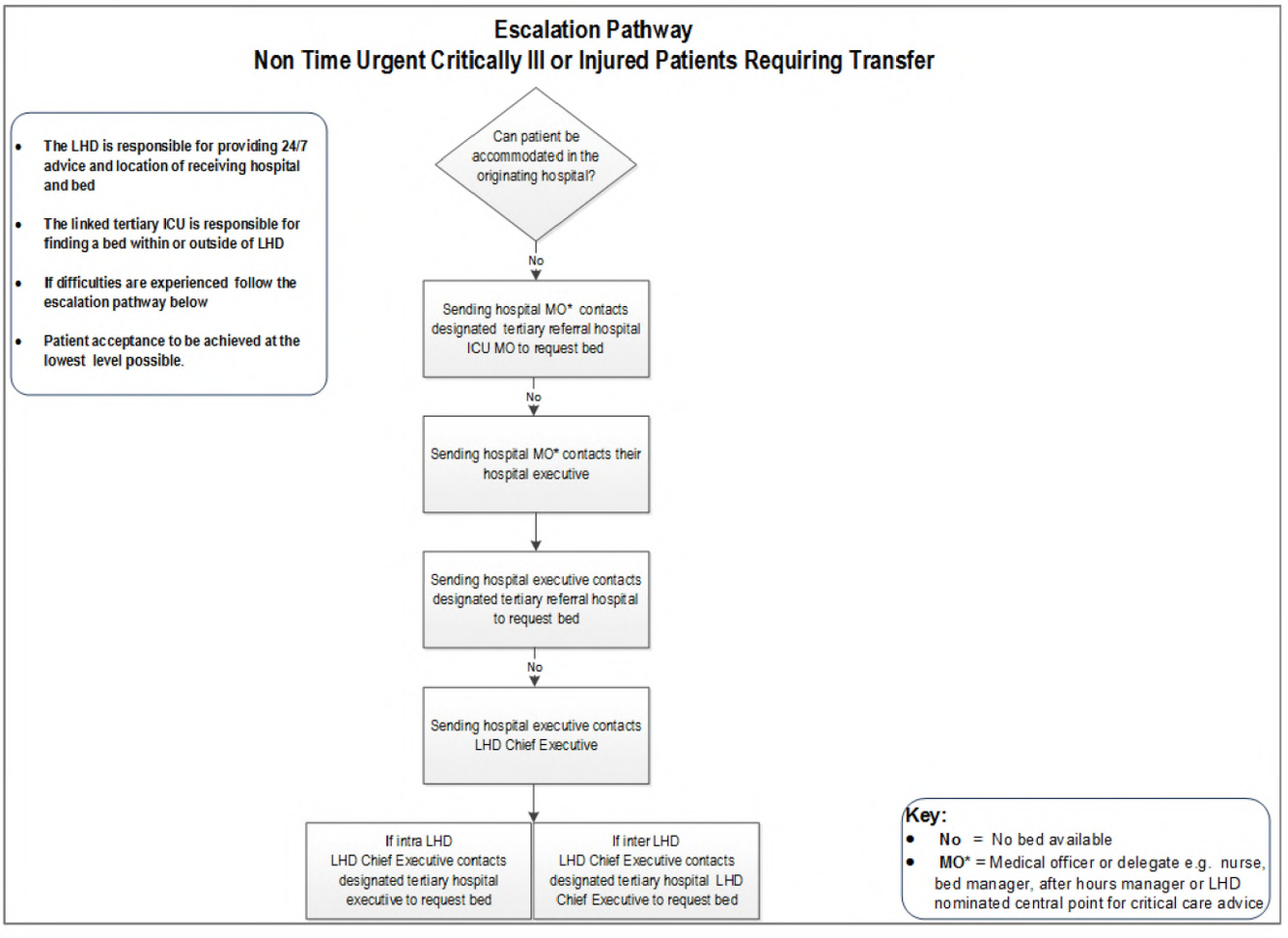
Aeromedical Control Centre (ACC) 1800 650 004.

APPENDIX 1: Critical Care Referral Process- Summary



- Time urgent referral - ACC 1800 650 004.(In emergencies notification can occur prior to full patient assessment and investigation)
- Non-time urgent referral - facilitated via CCRS via http://ccrs.health.nsw.gov.au
- Clinical specialty networks:
  - Burns - section 11.1:
    - Concord Hospital (02) 9767 5000
    - Royal North Shore Hospital (02) 9926 7111
  - Spinal - section 11.2
    - Prince of Wales Hospital (02) 9382 2222
    - Royal North Shore Hospital (02) 9926 7111
  - Trauma - section 11.3
  - Cardiac Catheterisation - section 11.4
  - Extra Corporeal Membrane Oxygenation (ECMO) - section 11.5
- Patients above 110kg must have bariatric sizing chart completed and sent to ACC.

APPENDIX 2: Escalation Pathway - Example



APPENDIX 3: Critical Care Referral Networks

LHD	Facilities	Tertiary Hospital
Central Coast	Gosford, Long Jetty, Woy Woy, Wyong	Royal North Shore
Far West [1]	Balranald, Broken Hill, Ivanhoe, Menindee, Tibooburra, Wentworth, White Cliffs, Wilcannia	Royal Prince Alfred, South Australia
Hunter New England	Armidale, Barraba, Belmont, Bingara, Boggabri, Bulahdelah, Cessnock, Denman, Dungog, Emmaville/Vegetable Creek, Glen Innes, Gloucester, Gunnedah, Guyra, Inverell, John Hunter, Kurri Kurri, Maitland, Manilla, Merriwa, Moree, Murrurundi/Wilson, Muswellbrook, Narrabri, Nelson Bay, Newcastle, Newcastle Mater, Quirindi, Scone, Singleton, Tamworth, Taree/Manning, Tenterfield/Prince Albert, Tingha, Walcha, Warialda, Wee Waa, Werris Creek, Wingham	John Hunter
Illawarra Shoalhaven	Bulli, Coledale, David Berry, Kiama, Milton Ulladulla, Port Kembla, Shellharbour, Shoalhaven, Wollongong	St George
Mid North Coast [2]	Bellingen, Coffs Harbour, Dorrigo, Kempsey, Macksville, Port Macquarie, Wauchope	John Hunter
Murrumbidgee [3] and [4]	Batlow, Tumut	Australian Capital Territory
	Boorowa, Murrumburrah-Harden, Young	Prince of Wales
	Lake Cargelligo	Royal Prince Alfred
	Barham Koondrook, Berrigan, Corowa, Culcairn, Deniliquin, Finley, Henty, Holbrook, Jerilderie, Tocumwal, Urana	St George
	Coolamon, Cootamundra, Griffith, Gundagai, Hay, Hillston, Junee, Leeton, Lockhart, Narrandera, Temora, Tumbarumba, Wagga Wagga, West Wyalong	St Vincent's
	Albury	Victoria
Nepean Blue Mountains	Blue Mountains, Hawkesbury, Lithgow, Nepean, Portland, Springwood	Nepean
Northern NSW	Ballina, Bonalbo, Byron, Casino, Coraki, Grafton, Kyogle, Lismore, Maclean, Murwillumbah, Nimbin, Tweed, Urbenville	John Hunter, Queensland
Northern Sydney	Castlecrag (Private), Dalcross (Private), Greenwich, Hornsby, Macquarie, Manly, Mater Misecordiae (Private), Mona Vale, Neringah, North Shore (Private) Royal North Shore, Royal Rehabilitation, Ryde, Sydney Adventist (Private)	Royal North Shore
South Eastern Sydney	Calvary Healthcare, Gower Wilson (Lord Howe Island), Prince of Wales, Prince of Wales Private, Royal Hospital for Women, St George, Sutherland, St Vincent's, St Vincent's Private, Sydney & Eye Hospital, War Memorial	Prince of Wales, St George
South Western Sydney	Bankstown, Braeside, Bowral, Camden, Campbelltown, Fairfield, Liverpool	Liverpool
Southern NSW [4]	Batemans Bay, Bega (South East Regional) Bombala, Braidwood, Cooma, Delegate, Moruya, Pambula, Queanbeyan, Yass	Australian Capital Territory
	Crookwell, Goulburn	Prince of Wales
Sydney	Balmain, Canterbury, Concord, Royal Prince Alfred	Royal Prince Alfred
Western NSW	Baradine, Bathurst, Blayney, Bourke, Brewarrina, Canowindra, Cobar, Collarenebri, Condobolin, Coolah, Coonabarabran, Coonamble, Cowra, Cudal, Dubbo, Dunedoo, Eugowra, Forbes, Gilgandra, Goodooga, Grenfell, Gulargambone, Gulgong Lightning Ridge, Molong, Mudgee, Narromine, Nyngan, Oberon, Orange/Bloomfield, Parkes, Peak Hill, Rylstone, Tottenham, Trangie, Trundle, Tullamore, Walgett, Warren, Wellington	Royal Prince Alfred
Western Sydney	Auburn , Blacktown, Baulkham Hills (Private),Cumberland, Mount Druitt, Westmead, St Josephs, Westmead Private	Westmead
St Vincent's	St Josephs	St Vincent's

Due to proximity some patients may be referred to: South Australia[1], Queensland [2], Victoria [3] and Australian Capital Territory [4]:
Retrievals- Adults: Contact ACC 1800 650 004

APPENDIX 4: Clinical Referral Networks and Specialty Referral Networks

LHD	Facilities	Receiving Tertiary Hospital				
		Critical Care	Burns	Spinal	Trauma	
					Regional	Major
ACT		NA	CRGH	POW	NA	NA
Central Coast	Gosford, Long Jetty, Woy Woy, Wyong	RNS	RNS	RNS	Gosford	RNS
Far West [1]	Balranald, Broken Hill, Ivanhoe, Menindee, Tibooburra, Wentworth, White Cliffs, Wilcannia	RPA SA- Adelaide	CRGH	RNS	Orange	Westmead, SA- Adelaide
Hunter New England	Armidale, Barraba, Belmont, Bingara, Boggabri, Bulahdelah, Cessnock, Denman, Dungog, Emmaville/Vegetable Creek, Glen Innes, Gloucester, Gunnedah, Guyra, Inverell, John Hunter, Kurri Kurri, Maitland, Manilla, Merriwa, Moree, Murrurundi/Wilson, Muswellbrook, Narrabri, Nelson Bay, Newcastle Newcastle Mater, Quirindi, Scone, Singleton, Tamworth, Taree/Manning, Tenterfield/Prince Albert, Tingha, Walcha, Warialda, Wee Waa, Werris Creek, Wingham	JHH	RNS	RNS	Tamworth	JHH
Illawarra Shoalhaven	Bulli, Coledale, David Berry, Kiama, Milton Ulladulla, Port Kembla, Shellharbour, Shoalhaven, Wollongong	STG	CRGH	POW	Wollongong	STG
Mid North Coast [2]	Bellingen, Coffs Harbour, Dorrigo, Kempsey, Macksville, Port Macquarie, Wauchope	JHH	RNS	RNS	Coffs Harbour, Port Maquarie	JHH
Murrumbidgee [3 and 4]	Batlow, Tumut	ACT	CRGH	POW	Wagga	ACT
	Boorowa, Murrumburrah-Harden, Young	POW				
	Lake Cargelligo	RPA				STG
	Barham Koondrook[3], Berrigan[3], Corowa[3], Culcairn[3], Deniliquin[3], Finley[3], Henty[3], Holbrook[3], Jerilderie[3], Mercy Health Service, Tocumwal, Urana	STG			Wagga, Vic[3]	STG, Vic[3]
	Coolamon, Cootamundra, Griffith, Gundagai, Hay, Hillston, Junee, Leeton, Lockhart, Narrandera, Temora, Tocumwal[3], Tumbarumba[3], Wagga Wagga, West Wyalong	SVH				
	Albury[3]	Vic[3]			Vic[3]	Vic[3]
Nepean Blue Mountains	Blue Mountains, Hawkesbury, Lithgow, Nepean, Portland, Springwood	Nepean	CRGH	RNS	Nepean	Westmead
Northern NSW [2]	Ballina, Bonalbo, Byron, Casino, Coraki, Grafton, Kyogle, Lismore, Maclean, Murwillumbah, Nimbin, Urbenville	JHH,QLD[2]	RNS	RNS	Lismore,	QLD
	Tweed[2]	JHH, QLD[2]			Tweed[2]	
Northern Sydney	Castlecrag (Private),Dalcross (Private), Frenches Forrest, Greenwich, Hornsby, Macquarie, Manly, Mater Misecordiae (Private), Mona Vale, Neringah, North Shore (Private) Royal North Shore, Royal Rehabilitation, Ryde, Sydney Adventist (Private)	RNS	RNS	RNS	NA	RNS
South Eastern Sydney	Calvary Healthcare, Gower Wilson (Lord Howe Island), Prince of Wales, Prince of Wales Private, Royal Hospital for Women, St , George, Sutherland, St Vincents, St Vincents Private, Sydney & Eye Hospital, War Memorial	POW, STG	CRGH	POW	NA	STG
South Western Sydney	Bankstown, Braeside, Bowral, Camden, Campbelltown, Fairfield, Liverpool	Liverpool	CRGH	POW	NA	Liverpool
Southern NSW [4]	Batemans Bay, Bega (South East Regional), Bombala, Braidwood, Cooma, Delegate, Moruya, Pambula, Queanbeyan, Yass	POW, ACT[4]	CRGH	POW	NA	ACT[4]
	Crookwell, Goulburn	POW, STG				
Sydney	Balmain, Canterbury, Concord, Royal Prince Alfred	RPA	CRGH	POW	NA	RPA
Western NSW	Baradine, Bathurst, Blayney, Bourke, Brewarrina, Canowindra, Cobar, Collarenebri, Condobolin, Coolah, Coonabarabran, Coonamble, Cowra, Cudal, Dubbo, Dunedoo, Eugowra, Forbes, Gilgandra, Goodooga, Grenfell, Gulargambone, Gulgong Lightning Ridge, Molong, Mudgee, Narromine, Nyngan, Oberon, Orange/Bloomfield, Parkes, Peak Hill, Ryistone, Tottenham, Trangie, Trundle, Tullamore, Walgett, Warren, Wellington	RPA	CRGH	RNS	Orange	Westmead
Western Sydney	Auburn , Blacktown, Baulkham Hills (Private),Cumberland, Mount Druitt, Westmead, St Josephs, Westmead Private	Westmead	CRGH	RNS	NA	Westmead
St Vincents	St Josephs	SVH	CRGH	POW	NA	NA

KEY

Due to proximity some patients may be referred to:
1. SA
2. QLD
3. VIC
4. ACT

ACT- Australian Capital Territory
CRGH- Concord
JHH- John Hunter
POW- Prince of Wales
RPA- Royal Prince Alfred
RNS- Royal North Shore
SA- South Australia
STG- St George
SVH- St Vincents
QLD- Queensland

Due to proximity some patients may be referred to: South Australia [1], Queensland [2], Victoria [3], Australian Capital Territory [4]:
Retrievals- Adults: Contact ACC 1800 650 004

APPENDIX 5: Bariatric Sizing Chart for Aeromedical Transport

NSW Ambulance

NSW Ambulance

Aeromedical Control Centre

Bariatric Sizing Chart

For all patients above 110kg

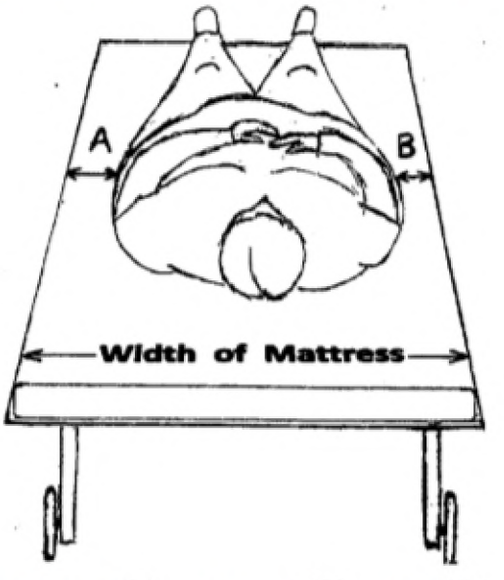
Patient Name…… Booking Reference No……

Requesting Hospital…… Hospital Fax No……

INSTRUCTIONS FOR MEASURING PATIENT

- Take measurements with patient lying on the mattress.
- Measure width of mattress (see diagram)
- Measure from side of patient to edge of mattress at A and B (refer to diagram below).
- Do these measurements at the patient's widest part. (This may be at the shoulders, abdomen or hips)
- Write results in boxes below. We will calculate the patient's width from the measurements you send us.

Width of Mattress	cm
Measurement A	cm
Measurement B	cm
Accurate Patient's Weight	kg
Patient's Height	cm



Widest Part (Tick ✓ where measurements were taken at) Shoulders ☐ Abdomen ☐ Hips ☐

Inaccurate measurements may result in significant delay of transport of your patient.

When complete please fax to: 02 9553 2270

Thank you

Version 1 12/03/2014

APPENDIX 6: Preparation for Retrieval - Making the Call

PREPARATION FOR ADULT RETRIEVAL – MAKING THE CALL

A STRUCTURE FOR TELEPHONE HANDOVER. IT IS NOT INTENDED TO REPLACE THE MEDICAL RECORD.

INTRODUCTION	YOUR NAME, ROLE, FACILITY AND CONTACT NUMBER		
IDENTIFY PATIENT	NAME	AGE	GENDER
	DOB	MRN	ADDRESS
SITUATION	MAIN DIAGNOSIS/ PROBLEM	OTHER DIAGNOSES / PROBLEMS	
	REASON FOR TRANSFER	PERCEIVED URGENCY	
BACKGROUND	HISTORY OF PRESENTING COMPLAINT		
	PAST MEDICAL HISTORY	MEDICATIONS	ALLERGIES / WEIGHT (BMI Form)

ASSESSMENT — CONVEY CONCERNS, UNCERTAINTIES AND URGENCY

LAST OBS:	RR	SpO_2	FiO_2	HR	BP	GCS	TEMP

DESCRIBE:	ASSESSMENT →	INTERVENTIONS →	RESPONSE
AIRWAY	AIRWAY AT RISK?		
BREATHING	RR, SpO_2, EFFORT, FOCAL FINDINGS, FiO_2, NIV/VENTILATOR SETTINGS		
CIRCULATION	HR/BP, ARRHYTHMIA, VASOACTIVE INFUSIONS		
DISABILITY	GCS, PUPILS, FOCAL FINDINGS, GLUCOSE, SEDATIVE INFUSIONS		
EXPOSURE	OTHER EXAM FINDINGS, TEMPERATURE, SECONDARY SURVEY IN TRAUMA		
FLUID BALANCE	INPUT (TYPE AND VOLUME), URINE OUTPUT, BLOOD LOSS, OTHER LOSSES		
INVESTIGATIONS	BLOODS, ABG, ECG, XRAYS, ULTRASOUND, CT		
LINES	IVC, CVC, ARTERIAL – TYPE AND LOCATION		
MICRO	ANTIBIOTICS, PRECAUTIONS (MRSE, VRE, BLOOD BORNE, RESPIRATORY)		
MENTAL STATE	CONFUSION, AGITATION, HARM TO SELF OR OTHERS, REQUIRES CHEMICAL OR PHYSICAL RESTRAINT		

IS THE PATIENT'S OVERALL CONDITION: IMPROVING? STABLE? DETERIORATING?

RECOMMENDATIONS FROM RETRIEVAL CONSULTANT

DESTINATION FACILITY / WARD	DESTINATION CONTACT NUMBER	MODE OF TRANSPORT	RETRIEVAL TEAM ETA

CALL RETRIEVAL CONSULTANT IF DETERIORATION / CHANGED PLAN

APPENDIX 7: Preparation for Retrieval - Checklist

PREPARATION FOR ADULT RETRIEVAL - CHECKLIST

DISCUSSED WITH RETRIEVAL CONSULTANT? ARRANGE RETRIEVAL PRIOR TO COMPLETING CHECKLIST

INTUBATED?

ETT POSITION CONFIRMED ☐ CAPNOGRAPHY ☐ CXR ☐ DEPTH AT INCISORS ____CM CUFF PRESSURE 20-30cmH_2O ☐

NGT/OGT + BAG ☐ 30 DEG HEAD UP ☐ CERVICAL COLLAR CONSIDERED ☐

SEDATIVE INFUSION ☐ ANALGESIC INFUSION ☐ SEE INFUSION TABLE FOR PREFERRED INFUSIONS

VENTILATION / NIV?

ADEQUATE VENTILATION? ☐ CHECK CAPNOGRAPY / TIDAL VOLUME / PEAK PRESSURE

ABG (CONSIDER ART LINE): SaO_2, CORRELATE $PaCO_2$ WITH $ETCO_2$

NOT FIGHTING VENTILATOR? ☐

TOLERATING NIV WITH NO EXCESSIVE LEAK ☐

CHEST TUBE(S) REQUIRED? ☐ POSITION & FUNCTION OK ☐

OPTIMISE HAEMODYNAMICS, ACCESS AND MONITORING

PATIENT +/- FLUID WARMED ☐ SEPSIS? APPROPRIATE ANTIBIOTICS ☐

TRAUMA? PELVIC BINDER / LIMB SPLINTS ☐ TRANEXAMIC ACID 1g (IF <3 HOURS) ☐

2 X IV CANNULA, SECURED AND FLUSHING, PORTS ACCESSIBLE ☐ FLUIDS/BLOOD ON PUMPSETS ☐

ARTERIAL LINE (IF INTUBATED, RESPIRATORY FAILURE OR LABILE BP) ☐

VASOPRESSOR INFUSION +/- CVC CONSIDERED ☐ SEE INFUSION TABLE FOR PREFERRED INFUSIONS

URINARY CATHETER ☐

PACKAGE FOR RETRIEVAL

SECURE ALL LINES, TUBES AND MONITORING ☐ EMPTY DRAINAGE BAGS / BLADDER ☐

SPINAL PRECAUTIONS REQUIRED? ☐ ADEQUATE ANALGESIA ☐ PROPHYLACTIC ANTIEMETICS ☐

DOCUMENTATION

PHOTOCOPY/PRINT ALL NOTES AND PLACE IN ENVELOPE ☐ ECGs ☐ IMAGING ☐ PATHOLOGY RESULTS ☐

DOCUMENT NEXT OF KIN AND CONTACT NUMBER ☐

EXPLAIN RETRIEVAL PROCESS TO PATIENT AND/OR RELATIVES ☐

CLARIFY PATIENT'S WISHES AND LIMITATIONS OF TREATMENT ☐ LOCAL SPECIALIST AWARE OF TRANSFER ☐

FLAG ANY ISSUES TO THE RETRIEVAL TEAM

CALL RETRIEVAL CONSULTANT IF DETERIORATION / CHANGED PLAN

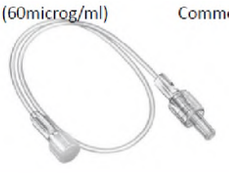
APPENDIX 8: Preparation for Retrieval - Common Infusion Table

PREPARATION FOR RETRIEVAL – COMMON INFUSION TABLE

USE 50ml LUER LOCK SYRINGES WITH MINIMUM VOLUME TUBING

ADRENALINE **3mg** Dilute to 50ml with 5% dextrose (60microg/ml) Commence at 1ml/hr, usual rate 1-20ml/hr

+



DRAW UP INFUSION DRUG

DRUG	DOSE	DILUTION	CONCENTRATION	TYPICAL RATE
PROPOFOL	**500mg**	Drawn up **undiluted** as 50ml	10mg/ml	2-20ml/hr
FENTANYL	**500micrograms**	Dilute to 50ml with 0.9% NaCl	10microg/ml	5-20ml/hr
MIDAZOLAM	**50mg**	Dilute to 50ml with 0.9% NaCl	1mg/ml	
KETAMINE	**400mg**	Dilute to 40ml with 0.9% NaCl	10mg/ml	Loading dose 2-5ml, usual rate 3-20ml/hr
MORPHINE	**50mg**	Dilute to 50ml with 0.9% NaCl	1mg/ml	
MORPHINE 50mg + MIDAZOLAM 50mg		Dilute to 50ml with 0.9% NaCl	1mg+1mg/ml	Loading dose 2-5ml, usual rate 2-5ml/hr
ADRENALINE	**3mg**	Dilute to 50ml with 0.9% NaCl	60microg/ml	Commence at 1ml/hr, usual rate 1-20ml/hr
NORADRENALINE	**3mg**	Dilute to 50ml with 0.9% NaCl	60microg/ml	Commence at 1ml/hr, usual rate 1-20ml/hr

PRIME LINES AFTER MIXING

IF >15mls/hr REQUIRED, DOUBLE INFUSION CONCENTRATION

DRUG	DOSE	DILUTION	CONCENTRATION	RATE
ADRENALINE	**6mg**	Dilute to 50ml with 0.9% NaCl	120microg/ml	
NORADRENALINE	**6mg**	Dilute to 50ml with 0.9% NaCl	120microg/ml	

CALL RETRIEVAL CONSULTANT IF DETERIORATION / CHANGED PLAN

APPENDIX 9: References

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