



AUSTRALIAN RESUSCITATION COUNCIL



AUSTRALIAN COLLEGE OF CRITICAL CARE NURSES

# Standards for Resuscitation: Clinical Practice and Education

## A Resource for Health Professionals

A Statement adapted from the British Standards for Clinical Practice and Training (2004) for The Australian Resuscitation Council in conjunction with The Australian College of Critical Care Nurses March 2008.

THIS STATEMENT IS ENDORSED BY THE FOLLOWING ORGANISATIONS



Royal Australasian College of Surgeons



Australian and New Zealand College of Anaesthetists



Royal College of Nursing Australia



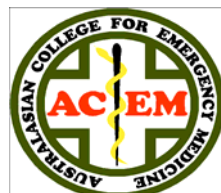
College of Emergency Nursing Australia



Cardiac Society of Australia and New Zealand



National Heart Foundation of Australia



Australasian College for Emergency Medicine



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## Contributors

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# 1. Introduction

Health care institutions have a duty of care to provide an effective resuscitation service for patients within the organisation and to ensure that the staff is educated to recognise acute deterioration.

These duties include access to appropriate equipment for resuscitation, provision of education, human and material resources to support provision of resuscitation services, a process for quality evaluation and continuous quality improvement. The education should enable staff to develop and maintain a level of competence appropriate to the role that they fulfil within the health care setting.

Since outcomes of unexpected cardiac arrest are poor, an important aspect of institutional health care planning is the delivery of timely and effective treatment to those at risk of deterioration.

This document provides guidelines for clinical practice and education for those responsible for resuscitation services within health care institutions.

Throughout this document, the term *health care institution* is used to designate an area where clinical care of patients is undertaken but is not limited to these areas and key principles can be applied across a broad range of health service spectrums. Health care institutions should base their resuscitation services on detailed assessment of risk for their individual sites.

## 2. Summary of Recommendations

- Health care institutions should have, or be represented on, a resuscitation committee that is responsible for all resuscitation issues.
- Policy documents should be evident that support the role, function and standards for resuscitation within the health care institution.
- Every institution should have a resuscitation coordinator responsible for provision of education sessions in resuscitation technique.
- Staff members in health care institutions who have direct patient contact should be provided with access to regular resuscitation education appropriate to their expected abilities and roles.
- Clinical staff should be provided with regular education that has recognition of the patient at risk of cardiopulmonary arrest as its focus. This should include the process to be undertaken for the prevention of cardiopulmonary arrest.
- Health care institutions admitting acutely ill patients should have a rapidly responding resuscitation team, or its equivalent, available on a 24 hour basis.
- If an area does not have full resuscitation facilities and staff to operate these facilities, a specialised team of personnel should be able to provide assistance on site within 3 minutes of a request for assistance.
- The institution should have an easily activated system to summon assistance.
- Guidelines that outline the roles and responsibilities of the response team should be readily available in the health care setting.
- The process for activating teams to assist with patients at risk of deterioration or experiencing cardiopulmonary arrest should be clear and readily available.
- Cardiopulmonary arrest should be managed according to current national/international guidelines.
- Appropriate resuscitation equipment should be available throughout the institution for clinical use and education purposes.
- The practice of resuscitation should undergo regular audit process to optimise outcome.
- A 'Not for Resuscitation', 'Do Not Attempt Resuscitation' or 'Respecting Patient Choices' policy should be available and patient wishes clearly documented for relevant staff to access. This process should be audited regularly.
- Appropriate levels of funding should be allocated to support an effective resuscitation service.

### 3. Resuscitation Committee

#### *Recommendations*

1. Each health care institution should have, or be represented on, a resuscitation committee that has established terms of reference and whose purpose is to ensure leadership of the resuscitation service.
2. Membership of the resuscitation committee should include representation from acute medical and nursing services and from a variety of disciplines in the health care setting. The number of representatives will depend upon local needs.
3. The resuscitation committee should take ownership of the implementation of organisational policies governing cardiopulmonary resuscitation. This should include educational policies for practice and the audit process. The committee should have the authority to determine the level of resuscitation education required by individual staff members.
4. The chair of the resuscitation committee should have the appropriate knowledge and skills in relation to resuscitation issues. The role should encompass the leadership ability to drive and implement change.
5. The resuscitation committee should take responsibility for:
  - Implementing national resuscitation guidelines and standards
  - Monitoring composition and function of the resuscitation team which may include a rapid response component in relation to patients at risk of sudden deterioration
  - Ensuring that access to appropriate equipment and medications is met and maintained in the health care setting
  - Evaluating outcomes for resuscitation education services in the health care institution
  - Determining access and requirements for resuscitation education resources
  - Ensuring appropriate monitoring and reporting on trends in resuscitation
  - Developing and revising policies and procedures that support resuscitation provision, for example, "not for resuscitation" guidelines
  - Recording and reporting risk-related incidents in relation to resuscitation or medical emergencies
6. The committee should have direct links to the senior executive or senior management committee within the health care institution. Ideally a member of the resuscitation committee should be from the executive structure.
7. Secretarial services should be provided to the resuscitation committee.
8. Appropriate financial support should be supplied to the resuscitation committee to maintain its outputs. A defined financial support process should be in place to support resuscitation services within the health care institution.
9. The resuscitation committee should develop and maintain a business plan which should indicate the resources required to maintain and upgrade clinical and education equipment throughout the health care institution and to provide appropriate staff and facilities for resuscitation education provision.

## 4. Resuscitation Officers/Coordinators

### *Recommendations*

1. Each health care institution should have an identified person who is responsible for coordinating the education and accreditation of staff in resuscitation. The number of resuscitation officers/coordinators may vary depending upon the size and geographical distribution of the health care institution.
2. Persons acting in the role of resuscitation officer/coordinator should have received appropriate education preparation for the role. This should include the possession of advanced life support or basic life support certification and educational qualifications/experience. Other appropriate qualifications should be considered important for the role for example paediatric advanced or basic life support certification.
3. The resuscitation officer/coordinator should have access to an appropriately resourced room to conduct resuscitation education sessions. Material resources to support the session should be appropriate to the level of education delivery. This will include electronic teaching aides and data projection capabilities. Consideration should be given to the portability of this equipment for offsite teaching.
4. The resuscitation officer/coordinator should have access to appropriate office space, secretarial support and office furnishings. Storage appropriate for the level of equipment and program materials should be available.
5. The resuscitation officer should ensure that all cardiopulmonary arrests are documented and audited using a standardised proforma based on current Utstein guidelines (refer to section 16). Use or reporting of this data should adhere to privacy and confidentiality laws.
6. The resuscitation officer should be involved in a process for auditing staff performance during cardiopulmonary arrests with the capacity to provide feedback and debriefing following the resuscitation attempt.
7. Upgrading of knowledge and skills in the area of resuscitation should be a key performance indicator for the role of resuscitation officer/coordinator. This may involve currency in resuscitation teaching for programs outside of the health care institution.

## 5. Education of Staff

### *Recommendations*

1. Staff should undergo regular resuscitation education to a level appropriate for their clinical responsibilities.
2. Health care institutions should have access to a process that identifies patients who are critically ill and therefore at risk of cardiopulmonary arrest. This may consist of a system of early warning signs or criteria that alerts staff to patient deterioration and process for calling experienced staff to assist with resuscitation.

3. Staff should receive education and practice in the recognition of patients at risk of acute deterioration and cardiopulmonary arrest. This should include education in the process for initiating appropriate therapeutic interventions as an important component of improving survival in critical illness.
4. A process of education should be in place to ensure that staff can undertake the skill of cardiopulmonary resuscitation. This would ensure that staff can
  - recognise cardiopulmonary arrest
  - summon assistance using the institutions recognised alert process
  - commence resuscitation using appropriate skills and resources, such as defibrillation within three minutes of collapse (ARC 2006). An appropriate audit process should determine this recommendation
  - understand the role of automated external defibrillation in relation to the community setting and the program of education that should be in place to support their placement.
5. It is recommended that clinical staff update their resuscitation skills on an annual basis (ARC Guideline 9.1.1 Feb 2007).
6. A system should be in place in health care institutions that identifies equipment that requires special education, for example manual defibrillators.
7. All staff members should receive resuscitation education as a component of their induction programme.
8. Acquisition of advanced life support skills such as the use of airway adjuncts, rhythm recognition, manual defibrillation and other therapeutic interventions should be encouraged, particularly in areas where analysis of rhythms is expected.
9. Education in resuscitation must be a fundamental requirement for medical, nursing and allied and other health qualifications irrespective of level of qualification. Health related undergraduate and postgraduate assessments should include an evaluation of competency in resuscitation.
10. The resuscitation officer/coordinator should organise and coordinate resuscitation education for staff - aspects of this may be delegated.
11. Health care institutions should provide time and resources for staff to attend resuscitation education and evaluation as a component of their employment.
12. Specialised education in cardiopulmonary resuscitation should be provided for medical and nursing staff in the relevant specialties for example, paediatrics, newborn, pregnancy and trauma.
13. All clinical staff should have the opportunity to attend a multidisciplinary program of education that has recognition, monitoring and management of the critically ill patient.
14. All staff education should be recorded in a central data base with audit reports made available to clinical areas.
15. Members of resuscitation teams should have access to a higher level of resuscitation education. This may be provided in the form of attendance at national resuscitation courses.

16. There should be access to appropriate equipment for education purposes. As a minimum, this should include access to adult and paediatric manikins, task trainers such as airway management manikins, rhythm monitoring and arrhythmia simulation facilities. Defibrillators should be available as used in the clinical areas. Maintenance and cost of consumables should be provided.
17. There should be a defined budget allocated to supporting the resuscitation role. This enables the resuscitation officer/coordinator to maintain, upgrade and purchase new equipment for patient use and education purposes.

## 6. Cardiopulmonary Arrest Prevention

### *Recommendations*

1. An early warning system should be available to identify patients at risk of acute deterioration and at risk of cardiopulmonary arrest.
2. The health care institution should have access to a designated outreach service, rapid response system or medical emergency team (MET) that has the capacity to respond to acute clinical situations identified by early warning systems or other clinical indicators.
3. The health care institution should have access to a patient data collection system that facilitates the regular measurement and recording of early warning scores.
4. The health care institution should have clearly identified policies and procedures that support the process for calling expertise to assist during medical emergencies. This should outline the roles and responsibilities of staff in attendance, the staff attending the medical emergency and the reporting process to the primary carers of the patient.
5. A process of identifying and reporting serious incidents should be in place in institutions. This may take the form of serious incident panels who outline recommendations. The resuscitation officer/coordinator is an integral member of the incident panel.

## 7. The Resuscitation Team

### *Recommendations*

The institution should have a team that is activated immediately in response to a cardiopulmonary arrest. The exact composition of the team will vary between institutions, but overall the team must have the following skills:

- Airway interventions, including tracheal intubation
- Intravenous cannulation, including central venous access
- Defibrillation (advisory and manual) and cardioversion
- Drug administration
- The ability to undertake advanced resuscitation skills (e.g. external cardiac pacing, pericardiocentesis, intercostal catheter insertion)
- Skills required for post- resuscitation care.

Consideration should also be given to creation of resuscitation teams that cater for specific groups (neonatal, paediatric, trauma, antenatal) where specific expertise is required. This may include specific calling plans for specialists.

1. The institutions resuscitation committee should determine the composition of the resuscitation team and any variations dependant on the type of resuscitation. The development of a medical emergency team (MET) to identify and manage patients at risk of cardiopulmonary arrest is strongly encouraged.
2. The resuscitation team should be responsible for issues relating to the management of relatives (who may or may not wish to be present) post resuscitation, transfer and debriefing.
3. The resuscitation team should be summoned to all cardiopulmonary arrests by the use of a common telephone number throughout the institution. A protocol for information should be supplied:
  - Adult/Paediatric/Neonatal/Trauma
  - Which Building (A, B, C)
  - Which Ward or area (e.g. Ward 2C, Engineering, Kitchen)
  - Which Bed area (Rm 12).
4. The institution must ensure that the resuscitation alert system is activated within 30 seconds of the call for help. This system must be tested regularly at a set time.
5. The resuscitation team should be on site within 3 minutes of a call for assistance.
6. The role of the team leader should be undertaken by an individual trained in ALS or if children are treated APLS. Ideally they should be trained as a team leader.
7. The team leader is responsible for:
  - directing and co-ordinating the resuscitation attempt
  - the safety of the resuscitation team at the cardiopulmonary arrest
  - ending the resuscitation attempt when indicated, often in consultation with other resuscitation team members and medical staff otherwise in charge of the patient

- documentation (including audit forms) and for communication with the relatives and other healthcare professionals involved in the patient's management
  - organising resuscitation team debriefing.
8. The institution should ensure that a complete and detailed record of the cardiopulmonary arrest (reflecting the Utstein template) is retained within the patient's clinical record. This data should also be recorded on a central database.
  9. In institutions where appropriate staff and facilities are not available for a resuscitation team, clear policies on scope of resuscitation practice by staff must be available. Co-ordination of a rapid response may be achieved with the ambulance service. Provision of this service must be organised with the ambulance service with a written service agreement. This rapid response will be achievable following a 000 call to the ambulance service.

## 8. Resuscitation of Newborn, Infants, Children, Pregnant Patients and Trauma Victims

### *Recommendations:*

Slightly different conditions apply to the resuscitation of newborn, infant, children, pregnant patients and trauma victims. The cause of cardiopulmonary arrest and techniques of resuscitation may differ. In all cases it is imperative that staff with the appropriate education and experience is in attendance at the resuscitation. In cases where appropriate staff, equipment and facilities are not available, consideration should be given to early contact with the appropriate retrieval service for advice and transport assistance.

### **Children**

1. When attempting the resuscitation of a newborn, infant or child in cardiopulmonary arrest, the team leader ideally should be someone with expertise and training in the resuscitation of the newborn, infants and children.
2. Specialised equipment and drug concentrations are required in the resuscitation of newborns and children. These are usually based on weight. Two people should be responsible for calculating, drawing up and administering all drugs.
3. Resuscitation of newborns, infants and children requires an understanding of the causes and treatment of cardiopulmonary arrest.
4. Ideally, all members of the team should have expertise in the resuscitation of this group.
5. All members should be familiar in their role of the resuscitation.
6. Ideally, institutions should have a separate paediatric resuscitation team. At least one member of the paediatric resuscitation team should possess a qualification in advanced paediatric resuscitation. All staff working in areas where newborns, infants and children are critically ill should be encouraged to attend national paediatric resuscitation courses, particularly in advanced paediatric life support.

7. When resuscitating newborns, infants and children, consideration should be given to the presence of the relatives. A member of staff should be delegated to stay with them and liaise with the team on their behalf.
8. If a child's weight is not available, the use of paediatric resuscitation charts, based on the length of the child or the child's weight based on age is encouraged.
9. Contact with a retrieval service should be considered where appropriate staff, equipment and services are not available.
10. Early identification of the newborn, infant and child at risk of cardiopulmonary arrest, through a specific early warning scoring system or other clinical indicators may assist in the prevention of cardiopulmonary arrest

### ***Pregnant Patients***

1. Early involvement of an obstetrician and neonatologist is crucial when dealing with cardiopulmonary arrest in the pregnant patient.
2. Particular attention should be paid to minimising vascular compression caused by the gravid uterus and to early advanced airway intervention.
3. Peri-mortem Caesarean section may have to be undertaken early in the resuscitation attempt and equipment should be immediately available.
4. Contact with a retrieval service should be considered where appropriate staff, equipment and services are not available.

### ***Trauma Victims***

1. Institutions admitting patients with major injuries should have access to a multidisciplinary trauma team.
2. Access to readily available blood services should be available.
3. Management of the airway can be particularly challenging and should be undertaken by an individual skilled in rapid sequence induction and tracheal intubation.
4. Resuscitation of the patient with major injuries may include the need for immediate surgery.
5. Contact with a retrieval service should be considered where appropriate staff, equipment and services are not available.

## 9. Resuscitation Equipment

### *Recommendations*

1. The choice of resuscitation equipment should be defined by the resuscitation committee and will depend on the anticipated workload, availability of equipment from nearby departments and specialised local requirements. Single use equipment and infection control issues should be considered.
2. Ideally, the equipment used for cardiopulmonary resuscitation (including defibrillators) and the layout of equipment and drugs on resuscitation trolleys should be standardised throughout the institution.
3. In specialist areas, such as paediatrics and neonatal areas, the equipment on the resuscitation trolley should specifically meet those needs. Recommended equipment for Neonatal, Paediatric, Adult and Primary Care Facilities Resuscitation Trolleys is located at the end of this section.
4. Staff must be familiar with the location of all resuscitation equipment within their working area.
5. Considerations should be given to the provision of resuscitation equipment or service in non clinical areas, e.g. car park, kitchen, engineering.
6. Portable oxygen and suction devices should be available at cardiopulmonary arrests, unless piped or wall oxygen and suction is at hand.
7. Provision should be made in all clinical areas to have access to resuscitation drugs, equipment for airway management, circulatory access and fluid administration, quickly enough to not compromise resuscitation efforts. In certain circumstances, this may require the use of portable items and these should be standardised throughout the institution.
8. In addition to resuscitation equipment, clinical areas should have immediate access to stethoscopes, a device for measuring blood pressure, pulse oximetry, capnography and a 12 lead ECG recorder.
9. The widespread deployment of automated external defibrillators (AEDs) will reduce the mortality from in-hospital cardiopulmonary arrest caused by ventricular fibrillation and pulseless ventricular tachycardia. The provision of AEDs enables all clinical staff to attempt defibrillation safely with minimal training, and their use is encouraged. These defibrillators should have recording facilities and standardised consumables. If AEDs are placed in paediatric areas, they should incorporate attenuation devices to deliver the appropriate energy.
10. Ideally, the choice of defibrillators should be standardised throughout the institution and staff should be familiar with the device in use and the mode of operation. Manual defibrillators should include the option of paediatric paddles in areas where children are treated. Defibrillators with an external pacing facility should be strategically located.
11. Responsibility for checking resuscitation equipment rests with the department where the equipment is held and checking should be audited regularly. Where two or more clinical areas share resuscitation equipment, responsibility for checking should be rotated so that all staff becomes familiar with the location and layout of resuscitation equipment. The frequency of checking will depend upon local circumstances but should ideally be daily.

12. A planned replacement programme should be in place for equipment and drugs with funding allocated for this purpose.
13. Signage that reflects national guidelines should be prominently placed to indicate the closest access point for resuscitation equipment and/or defibrillators.
14. All equipment should be latex-free and all intravenous equipment should be Luer-locking and incorporate needle-free ports.

## ***Suggested Equipment***

### **Neonatal Resuscitation**

<p><b>Airway and Breathing Equipment</b></p> <ul style="list-style-type: none"> <li>• Face masks - sizes 00, 01</li> <li>• Oropharyngeal airways - sizes 000, 00</li> <li>• Suction with Yankauer or other wide bore suction catheter - 6Fr, 8Fr, 10Fr, 12Fr</li> <li>• Laryngoscopes with large and small, straight and curved blades</li> <li>• Tracheal tubes - 2.5, 3.0, 3.5, 4.0mm ID</li> <li>• Endotracheal stylet or introducer</li> <li>• Magill forceps, neonatal size</li> <li>• Ayre's T-piece bagging circuit</li> <li>• Self inflating bag mask valve systems with pressure release valve and reservoir - 250ml and 500ml</li> <li>• CPAP delivery device</li> <li>• Tapes for fixing endotracheal tube</li> <li>• End Tidal Carbon Dioxide detector</li> <li>• Meconium suction device</li> <li>• Pulse oximeter</li> <li>• Nasogastric tubes - 5.0, 6.0</li> </ul>	<p><b>Circulation Equipment</b></p> <ul style="list-style-type: none"> <li>• Nasogastric tubes - 5.0, 6.0</li> <li>• Mosquito artery clamps</li> <li>• Umbilical vein catheterisation sets and umbilical catheters - 5Fr</li> <li>• Syringes - 5ml</li> <li>• Black silk suture - 4/0</li> <li>• Scalpel blades</li> <li>• Adhesive tape</li> <li>• Umbilical tape</li> <li>• IV cannula - 25 gauge</li> <li>• IV butterfly needles - 25 gauge</li> <li>• Intra-osseous needles</li> </ul>
<p><b>Drugs</b></p> <ul style="list-style-type: none"> <li>• Adrenaline 1:10,000 concentration</li> <li>• Volume expanders: Normal Saline, O Rh -ve blood readily available</li> <li>• Sodium bicarbonate: 0.5mmol/mL solution (4.2% concentration or diluted 8.4%)</li> </ul>	<ul style="list-style-type: none"> <li>• Neonatal resuscitation cot with oxygen and air cylinders, or</li> <li>• Firm surface with light, overhead heater and medical air and oxygen</li> <li>• Warm towels and blankets</li> <li>• Polyethylene bag or wrap</li> <li>• Neonatal stethoscope</li> <li>• Clock with timer in seconds</li> <li>• Naloxone hydrochloride: 400micrograms/mL solution</li> <li>• Sterile water for injection</li> </ul>

## Paediatric Resuscitation

<p><b>Airway</b></p> <ul style="list-style-type: none"> <li>• Non-rebreathing oxygen masks – paediatric and adult</li> <li>• Pocket mask – paediatric and adult +/- face shields</li> <li>• Oropharyngeal airways - sizes 00, 0, 1, 2, 3, 4</li> <li>• Self-inflating bag valve mask systems             <ul style="list-style-type: none"> <li>○ paediatric with pressure relief valve and reservoir</li> <li>○ adult with reservoir</li> </ul> </li> <li>• Face masks – sizes 00, 0/1, 2, 3, 4</li> <li>• Soft suction catheters – 6,8,10,12,14Fr</li> <li>• Yankauer sucker – adult and paediatric</li> <li>• Oxygen and Medical Air (either wall-piped or portable)</li> <li>• Suction (either wall-piped or portable)</li> <li>• Endotracheal tubes – un-cuffed 2.5 – 6 mm ID; cuffed sizes 4,5,6,7,8</li> <li>• Tracheostomy tube – cuffed sizes 4 - 6</li> <li>• Laryngeal masks - sizes 1, 1½, 2, 2½, 3</li> <li>• Laryngoscope handles, spare batteries and globes</li> <li>• Laryngoscope blades – straight sizes 0, 1; curved sizes 2, 3, 4</li> <li>• Stethoscope</li> <li>• End Tidal Carbon Dioxide detectors – paediatric and adult</li> <li>• Nasogastric tubes – sizes 6, 8, 10, 12</li> <li>• Tracheal stylet or introducer – small, medium and large</li> <li>• Gum elastic bougies – 5Fr, 10Fr</li> <li>• Magill's forceps – paediatric and adult</li> <li>• Lubricating gel</li> <li>• Adhesive tapes, cotton tie</li> <li>• Scissors</li> <li>• Tongue depressors</li> </ul>	<p><b>Circulation Equipment</b></p> <ul style="list-style-type: none"> <li>• Alcohol skin prep wipes</li> <li>• IV cannulae – 14, 16, 18, 20, 22, 24g</li> <li>• Intra-osseous needles</li> <li>• Syringes – 1, 2, 5, 10, 20 and 50ml</li> <li>• Selection of needles</li> <li>• Saline ampoules</li> <li>• Water ampoules</li> <li>• Arm boards</li> <li>• Back board</li> <li>• Paediatric blood pressure cuffs</li> <li>• Extension set with 3-way taps and bungs</li> <li>• Tape, occlusive dressing for dressing cannula</li> <li>• Forceps for securing intra-osseous needle</li> <li>• IV administration sets (burette and blood giving set)</li> </ul>
<p><b>Additional items</b></p> <ul style="list-style-type: none"> <li>• Bedside glucose monitoring</li> <li>• ECG electrodes – paediatric and adult</li> <li>• Biphasic defibrillator/monitor/gel-pads/hands-free pads</li> <li>• Sharps disposal container</li> <li>• Gloves</li> <li>• Clock/stopwatch</li> <li>• Oxygen saturation monitor and probes</li> <li>• Nebulizer mask and bowl – infant, paediatric and adult</li> <li>• Broselow tape/Oakley chart/profile charts</li> <li>• Drug labels/plain labels</li> <li>• Resuscitation Audit/Recording chart</li> <li>• Algorithms</li> </ul>	<p><b>Blood sampling containers</b></p> <ul style="list-style-type: none"> <li>• FBE, U&amp;E's</li> <li>• Glucose</li> <li>• Blood Cultures</li> <li>• Clotting</li> <li>• Cross match, group and save</li> <li>• Virology</li> <li>• Toxicology</li> <li>• ABG's</li> </ul> <p><b>Drugs and Fluids</b></p> <ul style="list-style-type: none"> <li>• Colloid solution</li> <li>• 0.9% Sodium chloride</li> <li>• 10% Dextrose</li> <li>• 1:10,000 Adrenaline</li> <li>• 1:1000 Adrenaline</li> <li>• Amiodarone and 5% Dextrose</li> <li>• Lignocaine</li> <li>• Sodium bicarbonate 8.4%</li> <li>• 50% Dextrose</li> <li>• 20% Mannitol</li> <li>• Other drugs             <ul style="list-style-type: none"> <li>○ Adenosine</li> <li>○ Atropine</li> <li>○ Salbutamol</li> <li>○ Calcium chloride</li> <li>○ Diazepam</li> <li>○ Midazolam</li> <li>○ Morphine</li> <li>○ Magnesium</li> <li>○ Naloxone</li> </ul> </li> </ul>

## Adult Resuscitation

<p><b>Airway Equipment</b></p> <ul style="list-style-type: none"> <li>• Pocket mask with oxygen port</li> <li>• Self inflating resuscitation bag valve mask system with oxygen reservoir and tubing (with filter if not disposable)</li> <li>• Clear face masks - sizes 3, 4, 5</li> <li>• Oropharyngeal airways - sizes 2, 3, 4, 5</li> <li>• Nasopharyngeal airways - sizes 6, 7</li> <li>• Suction (either piped or portable)</li> <li>• Yankauer Suckers</li> <li>• Tracheal suction catheters - sizes 12Fr, 14Fr</li> <li>• Laryngeal mask airways - sizes 4, 5</li> <li>• Magill's forceps</li> <li>• Endotracheal tubes – oral, cuffed sizes 6 – 9mm ID</li> <li>• Intubating stylet</li> <li>• Laryngeal masks – sizes 3, 4, 5, 6</li> <li>• Tracheostomy tubes – cuffed sizes 6 –10 mm ID</li> <li>• Gum elastic bougie or equivalent</li> <li>• Lubricant gel</li> <li>• Laryngoscope handles</li> <li>• Laryngoscope blades (standard and long)</li> <li>• Spare batteries and spare bulbs (if applicable)</li> <li>• Fixation for tube (ribbon gauze/tape)</li> <li>• Scissors</li> <li>• Selection of syringes</li> <li>• Non-rebreathing oxygen mask</li> <li>• Oxygen (piped or portable)</li> <li>• Stethoscope</li> <li>• End Tidal Carbon Dioxide detector/monitor</li> <li>• Nasogastric tubes</li> <li>• PEEP Valve</li> </ul>	<p><b>Drugs</b></p> <p>a) First line drugs</p> <ul style="list-style-type: none"> <li>• Adrenaline 1mg (1:10,000) x 4</li> <li>• Atropine 1mg x 1</li> <li>• Amiodarone 150mg ampoules x2 and 5% Dextrose</li> <li>• Lignocaine 1 mg</li> </ul> <p>b) Other readily available drugs</p> <p>Intravenous medications</p> <ul style="list-style-type: none"> <li>• Adenosine 6mg x 10</li> <li>• Adrenaline 1 mg (1:10,000) x 4</li> <li>• Adrenaline 1 mg (1:1000) x 2</li> <li>• Amiodarone 150mg ampoules x2</li> <li>• Calcium chloride 1g/10ml (6.8mmol/10ml) x1</li> <li>• Diazepam 10mg/2ml</li> <li>• Glucose 50% x 1</li> <li>• Magnesium Sulphate 2.5g/5ml</li> <li>• Midazolam 10mg</li> <li>• Naloxone 400mcg x 1</li> <li>• Potassium Chloride</li> <li>• Propofol 200mg/20mls</li> <li>• Sodium bicarbonate 8.4% 100ml x1</li> <li>• Vasopressin 20units/ml</li> </ul> <p>Other Medications/equipment</p> <ul style="list-style-type: none"> <li>• Salbutamol 5mg nebulas x 2</li> <li>• Ipratropium 500mcg nebulas x 2</li> <li>• Nebuliser device and mask</li> <li>• GTN spray</li> <li>• Aspirin 300mg</li> <li>• Frusemide</li> </ul>
<p><b>Circulation Equipment</b></p> <ul style="list-style-type: none"> <li>• Biphasic defibrillator (shock advisory module and or external pacing facility to be decided by local policy)</li> <li>• ECG electrodes</li> <li>• Defibrillation gel-pads or self-adhesive defibrillator pads</li> <li>• Selection of IV cannulae</li> <li>• Selection of syringes and needles</li> <li>• Cannula fixing dressings and tapes</li> <li>• Seldinger central venous catheter kit</li> <li>• Intravenous infusion sets</li> <li>• 0.9% sodium chloride – 1000ml x 2</li> <li>• Arterial blood gas syringes</li> <li>• Tourniquet</li> </ul>	<p><b>Additional Items</b></p> <ul style="list-style-type: none"> <li>• Clock</li> <li>• Gloves/goggles/aprons</li> <li>• Audit forms</li> <li>• Sharps container and clinical waste bag</li> <li>• Large scissors</li> <li>• Alcohol wipes</li> <li>• Blood sample bottles</li> <li>• A slide sheet or similar device for safe handling</li> <li>• Blood glucose monitoring</li> <li>• Oxygen saturation monitor and probes</li> <li>• Drug labels/plain labels</li> <li>• Resuscitation recording chart</li> <li>• BLS and ALS flowcharts</li> </ul>

## Resuscitation Equipment for Primary Care Facilities

<ul style="list-style-type: none"> <li>• Oxygen mask with reservoir bag</li> <li>• Pocket mask with one way valve</li> <li>• Self-inflating bag valve mask system</li> <li>• Oropharyngeal airways</li> </ul>	<ul style="list-style-type: none"> <li>• Syringes and needles (various sizes)</li> <li>• IV cannulae (various sizes)</li> <li>• IV Fluids</li> <li>• Oxygen (piped or portable)</li> <li>• Suction</li> </ul>	<ul style="list-style-type: none"> <li>• Adrenaline 1mg</li> <li>• Atropine 1mg</li> <li>• Amiodarone 300mg</li> <li>• Saline flush</li> <li>• Tape</li> <li>• Gloves</li> <li>• Sharps box</li> <li>• Razor</li> </ul>	<ul style="list-style-type: none"> <li>• Scissors</li> <li>• Yankauer Sucker</li> <li>• Suction catheters</li> <li>• Automated external defibrillator with self- adhesive pads</li> </ul>
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## 10. Decisions Relating to Cardiopulmonary Resuscitation

### *Note*

The information in this section is generalised. Specific information regarding decisions related to cardiopulmonary resuscitation should be sought from the Medical Treatment Act and Office of the Public Advocate in each state. Individual institutions should seek guidance from their legal counsel regarding their own written policy or document about resuscitation decisions.

### *Recommendations*

1. Because laws governing the use of Do Not Attempt Resuscitation (DNAR)/Not For Resuscitation (NFR) forms and advanced directives vary by jurisdiction, healthcare providers should be aware of local laws and regulations. Legal counsel on any policy regarding DNAR/NFR should be sought.
2. It is essential to identify (a) patients for whom cardiopulmonary arrest is an anticipated terminal event and in whom cardiopulmonary resuscitation is inappropriate; and (b) competent patients who do not wish to be treated with CPR.
3. All institutions should ensure that there is a clear and explicit resuscitation plan for all patients. For some patients this will involve a DNAR/NFR decision. Institutions should have a written policy about resuscitation decisions (including DNAR/NFR decisions) that is available to all clinical and managerial staff.
4. Where there is no resuscitation plan and the wishes of the patient are unknown, resuscitation should be initiated if cardiopulmonary arrest occurs. However, a decision not to attempt resuscitation may be appropriate when:
  - The patient's condition indicates that an attempt at resuscitation is unlikely to be successful in saving life (futility)
  - CPR is not in accord with the recorded, sustained wishes of a mentally competent patient (right of refusal)
  - CPR is not in accord with an applicable advance directive – check with state legislation regarding the legal standing of advance care directive
  - Where CPR imposes burdens outweighing benefits upon the patient
  - Successful CPR is likely to be followed by a quality of life that is not in the patient's best interests.
5. The overall responsibility for a DNAR/NFR decision lies with the most senior medical practitioner in charge of the patient's care. The opinions of the members of the medical and nursing team, the patient, and the patient's relatives (when appropriate) may be taken into account when forming the decision.
6. The most senior available member of the medical team should enter the DNAR/NFR decision and the reasons for it in the medical records. It should also be documented whether the patient and relatives have been informed and their comments noted. If no discussion has taken place, the reasons for this should be documented. The use of a dedicated DNAR/NFR form is to be encouraged.
7. The DNAR/NFR decision should be communicated effectively to all members of the multidisciplinary team involved in the patient's care. It should be reviewed regularly if there are changes in the patient's condition. The decision should be documented in the medical record and handed on at each change of shift.

8. A decision not to attempt resuscitation applies only to CPR. It should be made clear to the patient, people close to the patient and members of the healthcare team that this does not imply “non-treatment” and that all other treatment and care that are considered appropriate for the patient will continue to be considered and offered.
9. The institutions should provide information for staff, patients and relatives about resuscitation decisions. This can be in the form of organisational policies, patient brochures and information sheets.
10. State and Territory Legislation differs considerably in relation to End of Life Decisions

Consent:	End-of-Life Decisions:
NSW: Guardianship Act 1987; Children (Care and Protection) Act 1987	Commonwealth: Euthanasia Law Act 1997
Qld: Powers of Attorney Act 1988	NSW: Crimes Act 1900 (sections 13a – 13c)
SA: Consent to Medical Treatment and Palliative Care Act 1995; Guardianship and Administration Act 1993	Vic: Crimes Act 1958 (section 6a); Medical Treatment Act 1988
Vic: Medical Treatment Act 1988;	Qld: Criminal Code Act 1899 (section 311)
WA: Guardianship and Administration Act 1990	SA: Criminal Law Consolidation Act 1935 (section 13a); Consent to Medical Treatment and Palliative Care Act 1995; Natural Death Act 1983 [this has been repealed - however directions made under this act remain effective]; Death Definition Act 1983
Tas: Guardianship and Administration Act 1995	WA: Criminal Code Act 1913 (section 288)
ACT: Powers of Attorney Act 1956, Guardianship and Management of Property Act 1991; Medical Treatment Act 1994	Tas: Criminal Code Act 1924 (section 163)
	NT: Criminal Code Act 1983 (section 168); Natural Death Act 1988, Natural Death Regulations 1989
	ACT: Medical Treatment Act 1994; Guardianship and Administration Act 1986.

## 11. Patient Transfer and Post-Resuscitation Care

### *Recommendations:*

1. Immediately following Return of Spontaneous Circulation (ROSC), most patients are clinically unstable and likely to require high levels of care and admission to a critical care facility. Since facilities for the continuation of care may not be available where the cardiopulmonary arrest occurred, transport of the patient may be necessary with the use of the ambulance service and/or retrieval medical teams.
2. Coordination of care and optimal transport modality during this period is vital. Appropriate staff should be consulted prior to transfer. When appropriate, rapid referral to specialists (e.g. cardiology or intensive care) should be made. It is the responsibility of the resuscitation team leader to ensure that the transfer of care from one group of clinicians to another is efficient.

The team leader should not leave the patient until this has occurred unless he/she has delegated care to an appropriate colleague.

3. The patient's condition should be stabilized as far as possible before transfer, but this should not delay definitive treatment.
4. Institutions must ensure that appropriate equipment, drugs and portable monitoring devices are readily available for the safe transfer of the patient from the scene of cardiopulmonary arrest to another facility, if required.
5. Transport between health care facilities requires proper planning and liaison with the appropriate ambulance service.
6. When transport of the patient requires road, air, or sea routes, the institution must ensure that members of staff are insured against personal injury.
7. A patient being transferred should be accompanied by staff appropriately trained in the safe transfer of patients.
8. Relatives should be informed about the transfer of a patient but should not expect to travel with the patient.
9. Appropriate staff debriefing should be offered to all health professionals involved in the resuscitation attempt. Health agencies should have the appropriate policies and procedures to support this practice.

## 12. Auditing and Reporting Standards

### *Recommendations:*

1. To ensure a high quality resuscitation service the institution should audit:
  - The availability and use of equipment (variable frequency)
  - The availability of cardiopulmonary arrest and peri-arrest drugs (variable frequency)
  - All cardiopulmonary arrests using the principles of the Utstein template (each event)
  - Resuscitation decisions/DNAR/NFR (each event) and of DNAR/NFR policies
  - Cardiopulmonary arrest outcomes (each event)
  - Critical incidents leading to cardiopulmonary arrest or occurring during the resuscitation attempt (each event)
  - The cleaning and decontamination of manikins (after each training session)
  - Other health and safety issues, e.g., manual handling.
2. Institutions are encouraged to collate the data and send it to relevant national audits.
3. Ideally, audit should include periods of 'debriefing' after resuscitation attempts.
4. Where audit has identified deficiencies, steps must be taken to improve performance. The resuscitation committee should receive appropriate support from the institutional executive.

## 13. Research

### *Recommendations*

1. Research is needed to improve the resuscitation service. Individuals who wish to further the scientific basis and clinical practice of resuscitation should be encouraged.
2. Clinical research in this area is challenging, not least because of the ethical issues raised. Individuals wishing to undertake research in resuscitation are advised to seek the advice and support of their local research ethics committees.
3. Advice and support can also be sought from the State Branches of the Australian Resuscitation Council.

## 14. Glossary

ALS	Advanced Life Support
APLS	Advanced Paediatric Life Support
BLS	Basic Life Support
CPR	Cardiopulmonary Resuscitation
DNAR	Do Not Attempt Resuscitation
MET	Medical Emergency Team
NFR	Not For Resuscitation
ROSC	Return of Spontaneous Circulation
AED	Automated External Defibrillator
ECG	Electrocardiography

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## 16. Cardiac Arrest Data Form Template

Date of Arrest	DD/MM/YYYY
Patient Identifier	
Sex	
Age	<ul style="list-style-type: none"> <li>• years (estimated) or</li> <li>• Date of Birth DD/MM/YYYY</li> </ul>
Cardiac Arrest determined by	
Cause of Cardiac Arrest	
Treatment before emergency services arrival	<ul style="list-style-type: none"> <li>• Bystander CPR</li> <li>• Defibrillation by bystander or implanted defibrillator</li> </ul>
Resuscitation attempted by emergency services	
Location of Arrest	<ul style="list-style-type: none"> <li>• In hospital</li> <li>• Out of hospital</li> </ul>
Witnessed	If witnessed: time of arrest
Initial rhythm	<ul style="list-style-type: none"> <li>• What rhythm (monitored)</li> <li>• Time when a provider clinically assessed need for CPR</li> </ul>
Chest compressions	Time first commenced
Defibrillation Attempt	<ul style="list-style-type: none"> <li>• Time first attempted</li> <li>• Energy level (if known)</li> </ul>
Ventilation	
Drugs	
Time of collapse (estimated)	(HH:MM)
Time of call receipt	(HH:MM)
Time vehicle stopped	(HH:MM)
Time of First rhythm analysis	(HH:MM)
Spontaneous circulation on arrival in ED	Time of ROSC (HH:MM)
Hospital admission	
Hospital discharge	<ul style="list-style-type: none"> <li>• Date of hospital discharge (or death)</li> <li>• Neurological status at discharge</li> </ul>

Revised Utstein cardiac arrest data collection form (I.Jacobs et al. *Resuscitation* 2004; 63: 233-249)