



ANZCOR Guideline 11.1 – Introduction to Advanced Life Support

Summary

Who does this guideline apply to?

This guideline applies to adults who require advanced life support.

Who is the audience for this guideline?

This guideline is for health professionals and those who provide healthcare in environments where equipment and drugs are available.

Recommendations

The Australian and New Zealand Committee on Resuscitation (ANZCOR) make the following recommendations:

1. As soon as possible, Advanced Life Support treatments are used to supplement any adult receiving Basic Life Support.
2. Hospitals consider using early warning, rapid response team, or medical emergency team systems to reduce the incidence of in-hospital cardiac arrests and in-hospital mortality.
3. Hospitals use a system validated for their specific patient population to identify individuals at increased risk of serious clinical deterioration, cardiac arrest, or death, both on admission to hospital and during their stay.

Guideline

1 Definitions

Cardiopulmonary resuscitation (CPR) is the technique of chest compressions combined with rescue breathing. The purpose of cardiopulmonary resuscitation is to temporarily maintain a circulation sufficient to preserve brain function until specialised treatment is available.

CPR has 3 fundamental components:

- A Airway assessment and management.
- B Breathing assessment and management.
- C Circulation assessment and management.

Basic Life Support (BLS) is the preservation or restoration of life by the establishment of and/or the maintenance of airway, breathing and circulation, and related emergency care. Adjunctive equipment is **NOT** essential for basic life support, however the use of Automated External Defibrillators (AEDs) by persons trained in their use but not trained in ALS techniques is encouraged by ANZCOR.

Advanced Life Support (ALS) is basic life support with the addition of invasive techniques e.g. manual defibrillation, advanced airway management, intravenous access and drug therapy.

Patients requiring BLS and ALS commonly have underlying problems including:

- ischaemic heart disease
- chronic respiratory disease
- drug overdose / toxicity
- drowning
- trauma
- electrolyte abnormalities
- peri-arrest arrhythmias.

2 Background

BLS is only a temporary measure to maintain ventilation and circulation. Effective external cardiac compression provides a cardiac output of only 20-30% of the pre-arrest value¹, and expired air resuscitation provides ventilation with an inspired oxygen concentration of only 15-18%². Electrical defibrillation is the mainstay of treatment for ventricular fibrillation and pulseless VT. The chance of successful defibrillation decreases with time. Therefore performance of good CPR and decreasing the time to defibrillation are the first priorities in resuscitation from sudden cardiac arrest. The purpose of BLS is to help maintain myocardial and cerebral oxygenation until ALS personnel and equipment are available.

- Effective BLS may increase the likelihood of successful defibrillation³.
- Effective BLS buys time until reversible causes can be diagnosed and/or treated.

Monitoring what we do is becoming even more important, including:

- the effectiveness of compressions (depth, rate and hands off periods);
- the adequacy of ventilation (avoiding over-ventilation and consequent deleterious effects);
- the timing of defibrillation with regard to likelihood of success (eg compressions before and after).

Emphasis is now also being focused on the pre-arrest period (early detection and prevention of cardiac arrest) and the post-resuscitation management.

An extensive review of many aspects of advanced life support was performed as part of the 2010 and 2015 Consensus on Science process⁵⁻¹². The information from this process has been incorporated into the following guidelines wherever appropriate.

3 Prevention of Cardiac Arrest

Children and young adults presenting with characteristic symptoms of arrhythmic syncope should have a specialist cardiology assessment, which should include an ECG and in most cases an echocardiogram and exercise test¹¹ [Class A, Expert consensus opinion].

Characteristics of arrhythmic syncope include: syncope in the supine position, occurring during or after exercise, with no or only brief prodromal symptoms, repetitive episodes, or in individuals with a family history of sudden cardiac death (SCD). In addition, non-pleuritic chest pain, palpitations associated with syncope, seizures (when resistant to treatment, or occurring at night) should raise suspicion of increased risk of arrhythmic syncope. Systematic evaluation in a clinic specializing in the care of those at risk for SCD is recommended in family members of young victims of SCD or those with a known cardiac disorder resulting in an increased risk of SCD¹¹ [Class B; Expert consensus opinion].

4 In-Hospital Pre-Arrest Detection and Management

In adult patients admitted to hospital, there is variable evidence regarding the use of early warning systems/rapid response team (RRT) systems or medical emergency team (MET) systems (compared with no such systems) to reduce cardiac and respiratory arrests and hospital mortality¹¹.

ANZCOR suggests that hospitals consider the introduction of an EWS/response team/MET system to reduce the incidence of IHCA and in-hospital mortality (CoSTR 2015 weak recommendation, low-quality evidence)¹². It is reasonable, and increasingly made mandatory by health authorities, that hospitals provide a system of care that includes^{11,13}:

- staff education about the signs of patient deterioration,;
- appropriate and regular vital signs monitoring of patients;
- clear guidance (e.g. via calling criteria or early warning scores) to assist staff in the early detection of patient deterioration;
- a clear, uniform system of calling for assistance, and;
- a clinical response to calls for assistance.

[Class A; Expert consensus opinion]

There is insufficient evidence to identify the best methods for the delivery of these components and, based on current evidence, this should be based on local circumstances.^{11, 13} [Class A; Expert consensus opinion]

Hospitals should use a system validated for their specific patient population to identify individuals at increased risk of serious clinical deterioration, cardiac arrest, or death, both on admission and during hospital stay ¹¹ [Class A; Expert consensus opinion].

There is insufficient evidence to identify specific educational strategies that improve outcomes (e.g. early recognition and rescue of deteriorating patient at risk of cardiac/respiratory arrest). Educational efforts have a positive impact on knowledge, skills, attitudes/confidence, and increase the frequency of activation of a response and should therefore be considered ¹¹ [Class A; Expert consensus opinion].

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