

# Australian Resuscitation Council: Adult advanced life support (ALS) guidelines 2006

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The Advanced Life Support committee of the Australian Resuscitation Council (ARC) was formed in 1991 to develop a consensus approach to standardised advanced life support (ALS) recommendations for Australia (first published in 1993).<sup>1</sup> The International Liaison Committee On Resuscitation (ILCOR) has recently published its Consensus on Science and Treatment Recommendations (COSTR) document.<sup>2</sup> The ALS committee of the ARC has updated its guidelines to incorporate this information.

The philosophy and policies for guideline development within the ARC have allowed updating of the guidelines whenever necessary, rather than waiting until a predetermined time for change. This is evidenced by the publication in July 2003 of the ALS guideline on therapeutic hypothermia after cardiac arrest, which was developed as a response to recent supportive high-level evidence and a consensus statement of the ALS committee of ILCOR.<sup>3</sup> The ARC process facilitates more timely implementation of beneficial strategies.

The adult ALS guidelines which have now been updated are listed in the Table and published in full on the Internet (<http://www.resus.org.au>).

The major changes to the previously published ALS guidelines relate to:

- refocusing on the provision of good cardiopulmonary resuscitation (CPR) (including minimising the interruptions to CPR);
- minimising the potential harm associated with ventilation; and
- maximising the likelihood of successful defibrillation.

These changes are summarised below.

In addition, a new guideline has been developed to expand on the legal and ethical issues related to resuscitation.

## Perform good CPR (Guideline 11.7)

Pauses in external cardiac compression during CPR are common, and appear to decrease the likelihood of successful defibrillation.<sup>4</sup> A period of well performed CPR has been demonstrated to improve the ventricular fibrillation (VF) waveform, and increase the likelihood of defibrillation success.<sup>5</sup> In some settings (eg, delayed response time), a period of CPR before defibrillation may increase the likelihood of defibrillation success.<sup>6</sup> Given the small chance of immediate recovery of spontaneous circulation after defi-

## Updated guidelines on adult advanced life support (ALS)

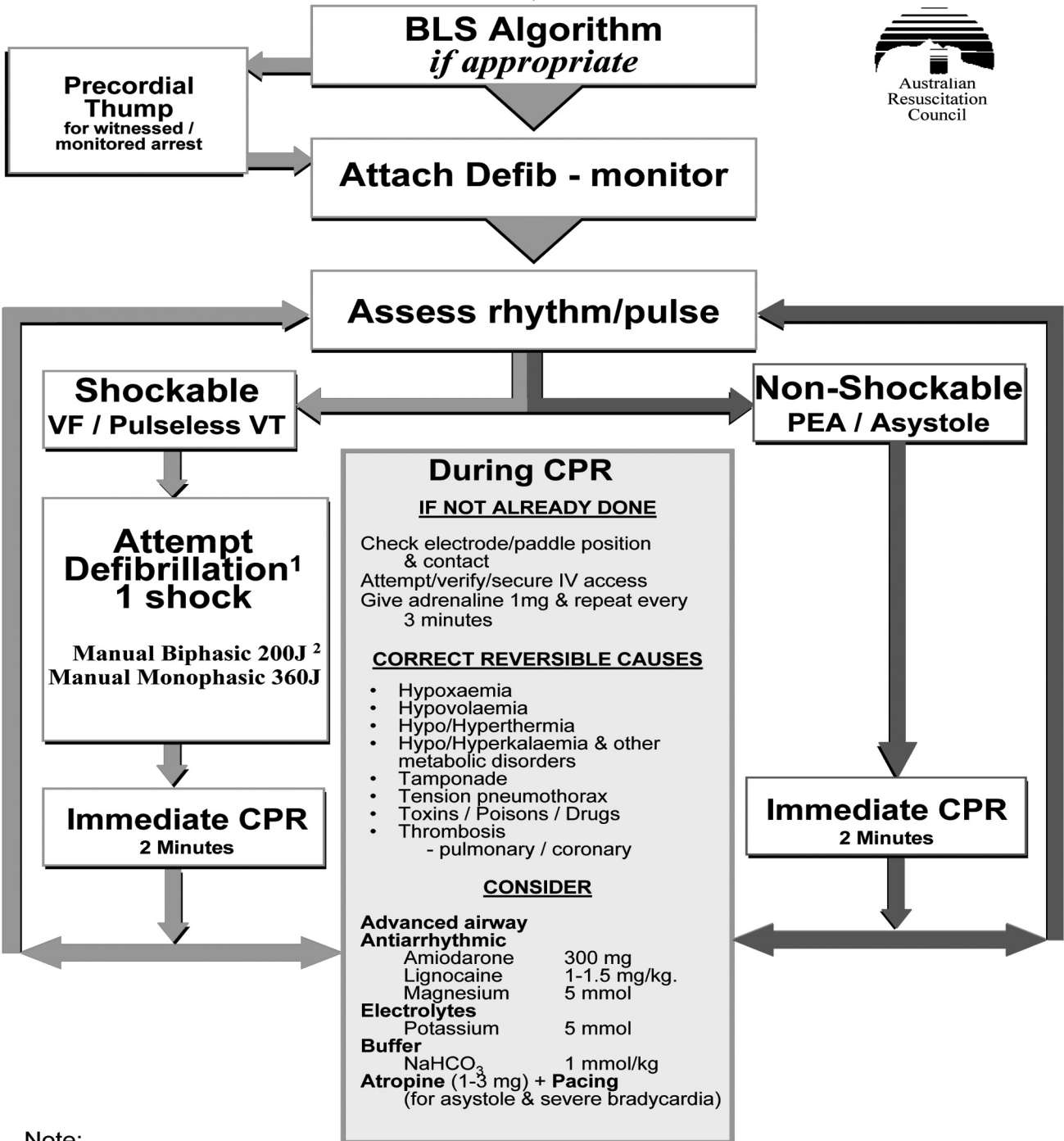
- |       |   |
|-------|---|
| 11.1  | Introduction to adult advanced life support               |
| 11.2  | Protocols for adult advanced life support                 |
| 11.3  | Precordial thump and fist pacing                          |
| 11.4  | Cricoid pressure  |
| 11.5  | Electrical therapy for adult advanced life support        |
| 11.6  | Medications in adult advanced life support                |
| 11.7  | Equipment and techniques in adult advanced life support   |
| 11.8  | Post-resuscitation therapy in adult advanced life support |
| 11.9  | Therapeutic hypothermia after cardiac arrest              |
| 11.10 | Legal and ethical issues related to resuscitation (new)   |
| 11.11 | First responder   |

brillation, it is recommended that CPR is recommenced immediately and, unless signs of life return, should be continued for 2 minutes before a rhythm check is performed.

## Avoid harm due to ventilation (Guideline 11.7)

Various studies have demonstrated that hyperventilation is associated with increased intrathoracic pressure, decreased coronary and cerebral perfusion, and, in animals, decreased return of spontaneous circulation.<sup>7</sup> Further studies have reported unexpected return of spontaneous circulation in cases in which resuscitation had ceased, and ventilation was shown on repeated occasions (or was highly likely) to result in gas trapping and consequent haemodynamic compromise.<sup>8</sup> As a result, the recommendation for ventilation of a victim without an advanced airway is that ventilation should be continued at a ratio of 30 compressions to 2 ventilations until an advanced airway is in place. After an advanced airway (eg, tracheal tube or laryngeal mask airway) is placed, ventilate the patient's lungs with supplementary oxygen to make the chest rise. During CPR for a patient with an advanced airway in place, it is reasonable to ventilate the lungs at a rate of 8–10 ventilations per minute. To minimise interruptions to CPR and the likelihood of excessive ventilation, one starting point in order to provide consistent ventilation and an adequate minute volume is to provide one breath after each 15 compressions. Carbon

# Adult Cardiorespiratory Arrest



**Note:**

1. For witnessed arrest, when using a manual defibrillator, give up to 3 stacked shocks at first defibrillation attempt. If further shocks are required these should be single shocks.
2. Default biphasic energy.

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dioxide estimation via arterial blood gas analysis may allow individual titration of ventilation.

### Maximise defibrillation success: single shock (Guideline 11.5)

The existing stacked-shock strategy has been associated with prolonged periods without CPR, for what appears to be limited incremental success.<sup>6</sup> The initiation of a one-shock strategy may improve outcome by reducing interruption of chest compressions. This strategy would be of benefit in scenarios where a significant time is required for rhythm recognition and recharging of the defibrillator (ie, >10 seconds), but its benefits depend entirely on the quality of CPR performed between shocks. It is recommended that a single-shock strategy be used in patients in cardiac arrest requiring defibrillation for VF or pulseless ventricular tachycardia (VT). When using this strategy, CPR should be resumed immediately after shock delivery, and interruptions minimised. A stacked-shock strategy (using up to three shocks as necessary) is recommended in cases where the occurrence of the cardiac arrest (VF or VT) has been witnessed by the rescuer, and a manual defibrillator is immediately available. If further shocks are indicated, a single-shock strategy is recommended.

### Maximise defibrillation success: adequate energy (Guideline 11.5)

Multiple human clinical studies have described initial biphasic defibrillator energy levels ranging from 100 J to 200 J, and subsequent energy levels ranging from 150 J to 360 J, without clearly demonstrating an optimal energy level.<sup>6</sup> It is recommended that the default energy level for biphasic waveforms in adults should be 200 J for all shocks (although other energy levels may be used providing there are relevant clinical data for a specific defibrillator suggesting that these energy levels provide adequate shock success). With a monophasic waveform defibrillator, an initial shock of 360 J is recommended.

In the vast majority of situations, the ARC approach to the detailed management of cardiac arrest is almost identical to most recent versions of other published international guidelines. There are some small international differences in the practical application of the COSTR document. One such area is the continued support in Australia for a sequence of up to three shocks when the arrest is witnessed, and a defibrillator is immediately available. Another is the appear-

ance of our ALS flow chart (Figure), which is a slightly more detailed version of the universal algorithm. The result is a chart that can be displayed as a poster on the wall or trolley as an aide-mémoire for use during a cardiac arrest.

As stated on the ARC website, and echoed throughout the world by guideline-producing bodies:

The ARC strongly affirms that, during this transitional period, existing practice should not be considered to be either ineffective or unsafe. The new guidelines do not reflect that what we have previously been doing is either wrong or harmful, but rather that we may be able to do better.

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### References

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- 8 International Liaison Committee on Resuscitation. 2005 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations. Part 4: Advanced life support. *Resuscitation* 2005; 67: 213-47. □