

# Clinical Skills in Hospitals Project

## Basic Life Support (BLS) adult

Module 1: Airway, Breathing and Chest Compression (ABC)

Module 2: Automatic External Defibrillator (AED)

Module 3: BLS 1

Module 4: BLS 2

Module 5: Complex BLS



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## Preface

In 2007 the Department of Human Services commissioned St Vincent's Hospital Melbourne, to design and develop simulation-based training packages for clinical skills trainers in Victorian hospitals.

The project provides Victorian health professionals—specifically, hospital clinical educators—with a resource to deliver simulation-based clinical skills training.

The information in this manual complements current training programs and should be considered as a resource in the workplace, rather than the definitive resource on the topic.

Every effort has been made to provide the most current literature references. Authors have consulted other health professionals and current programs when possible in development to ensure that the modules produced in this package are consistent with current health practices.



# Course delivery in condensed form

## Sample timetable for one-day workshop

This is an example of how the modules in BLS adult could be combined into a one-day workshop. A sample timetable is provided for a course consisting of Modules 1, 2 and 3, and a course consisting of Modules 3, 4 and 5.

### Course 1 (Modules 1, 2 and 3)

Timing	Activity		Objective
8.30 to 8.45	Introduction—faculty and participants		
8.45 to 9.30	Facilitated discussion		Module 1: 1, 2, 3
9.30 to 10.30	Skills station (three) <ul style="list-style-type: none"> <li>■ airway management</li> <li>■ bag-mask ventilation</li> <li>■ chest compressions</li> </ul>		Module 1: 4, 5 and 6
10.30 to 10.40	Summary of main points from Module 1		Module 1: all
<b>10.40 to 10.50</b>	<b>Morning tea</b>		
10.50 to 11.30	Facilitated discussion—AED		Module 2: 1 and 2
11.30 to 12.15	Skills stations: practice of AED		Module 2: 2, 3 and 4
12.15 to 12.30	Summary of main points from Module 2		Module 2: all
<b>12.30 to 1.15</b>	<b>Lunch</b>		
1.15 to 1.45	Introduction to simulation and trigger DVD of BLS in action		Module 3: 1
	Group 1	Group 2	
1.45 to 2.00	Simulation 1	Simulation 2	Module 3: all
2.00 to 2.30	Debrief	Debrief	Module 3: all
2.30 to 2.45	Simulation 2	Simulation 1	Module 3: all
2.45 to 3.15	Debrief	Debrief	Module 3: all
<b>3.15 to 3.30</b>	<b>Afternoon tea</b>		
3.30 to 4.00	Summary of main points from Module 3 Course evaluation		Module 3: all

## Course 2 (Modules 3, 4 and 5)

Timing	Activity		Objective
8.30 to 9.15	Introduction and review of BLS, including DVD of BLS in action		Module 3: 1
9.15 to 9.30	Introduction to simulation		
	Group 1	Group 2	
9.30 to 9.45	Simulation 1	Simulation 2	Module 3: all
9.45 to 10.30	Debrief	Debrief	Module 3: all
<b>10.30 to 10.45</b>	<b>Morning tea</b>		
10.45 to 11.00	Simulation 2	Simulation 1	Module 3: all
11.00 to 11.30	Debrief	Debrief	Module 3: all
11.30 to 12.00	Summary of Module 3		Module 3: all
<b>12.00 to 12.30</b>	<b>Lunch</b>		
12.30 to 1.00	Facilitated discussion—Module 4		Module 4: 1
1.00 to 1.15	Simulation 1	Simulation 2	Module 4: all
1.15 to 1.45	Debrief	Debrief	Module 4: all
1.45 to 2.00	Simulation 2	Simulation 1	Module 4: all
2.00 to 2.30	Debrief	Debrief	Module 4: all
2.30 to 2.45	Summary of Module 4		Module 4: all
<b>2.45 to 3.00</b>	<b>Afternoon tea</b>		
3.00 to 3.45	Facilitated discussion—team behaviours		Module 5: 1
3.45 to 4.00	Simulation 1	Simulation 2	Module 5: 2, 3 and 4
4.00 to 4.30	Debrief	Debrief	
4.30 to 4.45	Simulation 2	Simulation 1	Module 5: 2, 3 and 4
4.45 to 5.15	Debrief	Debrief	
5.15 to 5.30	<ul style="list-style-type: none"> <li>■ Summary of Module 5</li> <li>■ Course evaluation</li> </ul>		



# Basic Life Support (BLS) adult

## Introduction

*BLS adult* (basic life support) was developed as a teaching and learning tool for Victorian clinical educators. The information contained in each module was developed using evidence-based resources and examples of best practice. Where expert opinion varies, a discussion section is included. However, it is not within the scope of ALS paediatric to address the full spectrum of local variations. Variations can occur in several areas, including practices relating to types of equipment used, infection control processes, practice guidelines and so on. Therefore, educators should, where appropriate, adapt content to reflect their local policies, procedures and protocols. This will ensure the relevancy of the package content to your learners.

The modules are designed to be discrete courses in their own right. They are timetabled so they can be completed in a 1–2 hour timeframe. This timeframe was chosen after we received feedback from clinical educators requesting shorter courses, because health professionals often have limited time to educate away from patients. However, the packages may also be combined into a one- or two-day course, as described in the Module Outline.

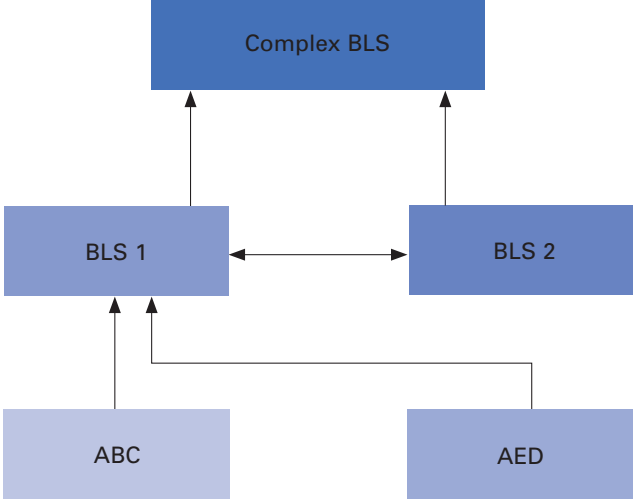
*BLS adult* should be used as an educational tool to assist in the teaching of clinical skills. It is structured as a guide to assist clinical educators, and uses many concepts taught in the *Clinical Skills in Hospitals Project* (train-the-trainer courses). Educators are encouraged to build on this resource by adding their own scenarios which incorporate hospital/health service protocols, policies and other resources. Each module is designed as a lesson plan to incorporate the simulations into the teaching of clinical skills.

## Aims

*BLS adult* aims to make participants confident in their application of basic life support (BLS) knowledge and skills on adults in different environments and settings.

## Package structure

*BLS adult* contains five modules which provide learning opportunities for health professionals at all levels of experience from medical and nursing disciplines. Modules 1 and 2 are regarded as fundamental. Modules 3 and 4 are more difficult, and are regarded as intermediate. Module 5 is more advanced and regarded as complex.

Level of complexity	Package structure
<p><b>Complex</b> For participants with more than 4 years experience or who have completed Modules 1–4</p>	 <pre> graph BT     ABC[ABC] --&gt; BLS1[BLS 1]     AED[AED] --&gt; BLS1     BLS1 &lt;--&gt; BLS2[BLS 2]     BLS1 --&gt; ComplexBLS[Complex BLS]     BLS2 --&gt; ComplexBLS           </pre>
<p><b>Intermediate</b> For participants in postgraduate years 3–4 or who have completed Modules 1 and 2</p>	
<p><b>Fundamental</b> For participants in postgraduate years 1–2</p>	

BLS (basic life support) includes basic airway management skills, rescue breathing techniques, external cardiac compressions and use of the automatic external defibrillator.

*BLS adult* was designed to develop participants' knowledge, skills and behaviours in BLS and to expose them to increasingly complex scenarios aimed at testing their ability to combine these individual skills, work as a team and problem solve in more difficult situations.

Educators delivering these modules should be aware of participants' level of experience and choose appropriate modules. Modules presume an increasing level of knowledge as they progress, ranging from a fundamental knowledge of anatomy and physiology for the fundamental modules, up to detailed knowledge of ALS and resuscitation for the complex modules. Novice participants (such as first-year graduates) are expected to start with the fundamental modules, and only move onto intermediate and more complex modules as they demonstrate proficiency. More experienced participants may start at the intermediate level if the educator is satisfied that they have the prior knowledge and skills. Individual educators are responsible for assessing each participants' baseline knowledge and determining which modules they need to complete. More specific descriptions of presumed knowledge are outlined in each module.

The design of these packages presumes that the clinical educators using them have knowledge and expertise in current best practice regarding the teaching of clinical skills and conducting facilitated discussions. Knowledge and expertise are presumed commensurate with the Department of Human Services' basic and advanced Train-the-Trainer programs. Clinical educators are encouraged to refer to the Department of Human Services' *Clinical Skills Facilitators Manual* for theory on:

1. Peyton's model for teaching clinical skills
2. leading small group discussions
3. giving feedback
4. crisis resource management skills.



# Module 1: Airway, Breathing and Chest Compression (ABC)

## Introduction

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The modules are designed to be discrete courses in their own right. They are timetabled so they can be completed in a 1–2 hour timeframe. This timeframe was chosen after we received feedback from clinical educators requesting shorter courses, because health professionals often have limited time to educate away from patients. However, the packages may also be combined into a one- or two-day course, as described in the Module Outline.

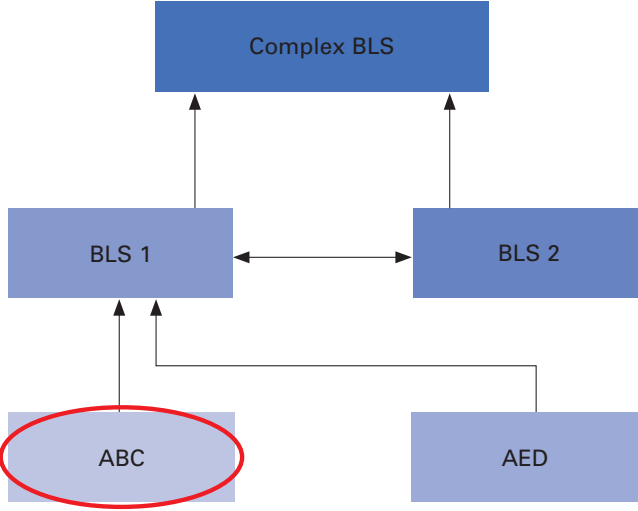
*BLS adult* should be used as an educational tool to assist in the teaching of clinical skills. It is structured as a guide to assist clinical educators, and uses many concepts taught in the Clinical Skills in Hospitals Project (Train-the-Trainer courses). Educators are encouraged to build on this resource by adding their own scenarios which incorporate hospital/health service protocols, policies and other resources. Each module is designed as a lesson plan to incorporate the simulations into the teaching of clinical skills.

## Aims

*BLS adult* aims to make participants confident in their application of basic life support (BLS) knowledge and skills on adults in different environments and settings.

## Package structure

*BLS adult* contains five modules which provide learning opportunities for health professionals at all levels of experience from medical and nursing disciplines. Modules 1 and 2 are regarded as fundamental. Modules 3 and 4 are more difficult, and are regarded as intermediate. Module 5 is more advanced and regarded as complex.

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<p><b>Fundamental</b> For participants in postgraduate years 1–2</p>	

BLS (basic life support) includes basic airway management skills, rescue breathing techniques, external cardiac compressions and use of the automatic external defibrillator.

*BLS adult* was designed to develop participants' knowledge, skills and behaviours in BLS and to expose them to increasingly complex scenarios aimed at testing their ability to combine these individual skills, work as a team and problem solve in more difficult situations.

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1. Peyton's model for teaching clinical skills
2. leading small group discussions
3. giving feedback
4. crisis resource management skills.





# Module 1: Airway, Breathing and Chest Compression (ABC)

Authors: Dr Stuart Dilley, Ms Debbie Paltridge

## Aims

The purpose of *BLS adult—Module 1: ABC* is to teach, and/or consolidate participants' knowledge of, individual clinical skills necessary for providing adult basic life support (BLS): airway, breathing and chest compression.

## Presumed knowledge

This module is targeted to health professionals with little or no experience in BLS. However, they are expected to have a basic knowledge of:

1. upper airway anatomy: mouth, tongue, mandible, pharynx, larynx
2. cardiovascular anatomy: heart, peripheral pulses
3. respiratory physiology: breath sounds, ventilation cycle
4. cardiovascular physiology: blood pressure, circulation.

## Objectives

By the end of this module, participants should have:

1. reviewed the Australian Resuscitation Council (ARC) Guidelines for BLS (adult)
2. identified the indications for BLS
3. identified local processes by which their own hospital's cardiac arrest team is mobilised
4. practised basic airway manoeuvre techniques on a manikin
5. practised rescue breathing on a manikin
6. practised external cardiac compressions on a manikin.

The purpose of this module is to teach participants the BLS skills of basic airway management, rescue breathing and chest compressions as distinct, individual skills. It does not cover the DRABC response, which is introduced in *BLS adult—Module 3: BLS 1* and *Module 4: BLS 2*, where participants have the opportunity to combine these individual skills in a resuscitation scenario.

## Background information for educators

### Airway

Death due to airway obstruction is rapid, but easily preventable. The airway may become obstructed by foreign bodies, including dentures, secretions and food, or from the patient's own anatomical structures, usually the tongue. In the unconscious patient, muscle tone and cough reflexes are reduced or absent, putting the patient at risk of airway obstruction. Obstruction may be partial or complete, and may progress rapidly from one to the other.

Airway management is indicated when:

1. the patient is unconscious
2. the patient has an obstructed airway
3. rescue breathing is required.

Patients who have collapsed and fallen to the ground from a standing position are unlikely to have sustained a significant neck injury. However, patients who struck their head on an object as they fell, or who are unconscious due to significant trauma (for example, motor vehicle accident, fall from height) are at greater risk of cervical spine injury. Consider potential cervical spine injury in these patients. Immobilise the cervical spine with a cervical collar (or other means until a collar is available), and select airway manoeuvres accordingly. However, airway management takes precedence over possible cervical spine injury.

Indications of an obstructed airway in a patient who attempts to breathe include:

1. paradoxical chest movements (chest collapses with attempts to inhale)
2. noisy breathing, stridor, gurgling
3. cyanosis.

In patients who are not breathing or attempting to breathe, airway obstruction may not become evident until attempts at rescue breathing commence.

The mouth and upper airway should be inspected for secretions and foreign bodies that might contribute to airway obstruction. Such obstruction may be relieved by these steps:

1. Turn the patient on their side to drain secretions.
2. Use suction if available.
3. Manually remove solid foreign bodies with fingers.
4. Remove ill-fitting dentures.

After removal of foreign bodies from the mouth and upper airway, the head tilt/chin lift method is most commonly used to maintain the airway. Lifting the chin lifts the tongue off the posterior pharyngeal wall by lifting the mandible forward. The rescuer should:

1. Position themselves at the side of the patient's head.
2. Place one hand on the patient's forehead.
3. Use the thumb and fingers of the other hand to lift the patient's chin.
4. Tilt the head (not the neck) backwards.



*Figure 1: Head tilt/chin lift*

Alternatively, use the jaw thrust method. This technique should be used where cervical spine injury is suspected, but can be used on any patient. The rescuer should:

1. Position themselves at the top of the patient's head.
2. Place their fingers behind the angle of the mandible on both sides.
3. Exert pressure with the fingers to thrust the mandible upwards, moving the tongue away from the posterior pharyngeal wall.
4. Use the thumbs to keep the mouth open.



*Figure 2: Jaw thrust*

Oropharyngeal (Guedel) airways are simple devices that can help obtain and maintain an airway. Oral airways should be sized and inserted as follows:

1. Measure from the corner of the patient's mouth to angle of jaw/tip of earlobe.
2. Initially insert upside-down.
3. Rotate 180 degrees as the device is introduced further into the mouth.

## Breathing

Once the unconscious patient's airway is cleared, the rescuer should check whether the patient is breathing. The rescuer should:

1. Look and feel for chest and abdominal movement.
2. Look and feel for air movement from the mouth and nose.

If adequate breathing is present, roll the patient on their side, while maintaining an open airway. Stay with the patient and regularly check for breathing and pulse until help arrives.

If the unconscious patient is not breathing after the airway is opened, commence rescue breathing. This involves:

1. Two initial breaths, allowing one second per inspiration.
2. Check for signs of life (unconscious, unresponsive, not moving, not breathing normally).
3. If signs of life absent, commence chest compressions.
4. Continue chest compressions and rescue breathing at a ratio of 30:2.

The technique of rescue breathing depends somewhat on the equipment available to the rescuer. Mask-to-mouth ventilation has a theoretical advantage over mouth-to-mouth ventilation in that a barrier exists between patient and rescuer, affording some protection against infectious disease and cross-contamination. The risk of transmission of infectious disease by mouth-to-mouth ventilation is extremely low. No cases of HIV or hepatitis B transmission have ever been reported<sup>3</sup>. Bag-mask ventilation has the added advantage of allowing the rescuer to provide supplemental oxygen when this is available.

For mouth-to-mouth rescue breathing, the rescuer should:

1. Position themselves at the side of the patient's head.
2. Obtain and maintain an open airway as described above.
3. Slightly open the patient's mouth and pinch the patient's nose.
4. Take a big breath and blow air into the patient's lungs.
5. Look for a rise of the patient's chest to indicate movement of air into the lungs.
6. Remove mouth from the patient to allow escape of air.
7. Turn head to observe the patient's chest falling and feel for the exhaled air.

For mouth-to-mask rescue breathing, the rescuer should:

1. Position themselves at the at the patient's head.
2. Obtain and maintain an open airway.

3. Place the narrow end of the mask over the bridge of the nose.
4. Use two hands to hold the mask.
5. Push down firmly on the mask with thumbs and fingers while simultaneously lifting the jaw into the mask to create a seal.
6. Blow air into the patient's lungs by blowing through the mouthpiece of the mask.
7. Look for a rise in the patient's chest.
8. Remove mouth from mask to allow exhalation.
9. Look for falling of the chest wall and feel for exhaled air.



*Figure 3: Mask to mouth*



*Alternate mask grip*



*Viewing chest rise and fall*

Most health professionals in the hospital setting favour a bag-mask device for rescue breathing. Responders should be familiar with the parts of such a device:

1. facemask
2. valve
3. pressure relief valve (not fitted to all devices, prevents excessive pressure being delivered to the patient's lungs)
4. ventilation bag
5. oxygen inlet connection
6. oxygen reservoir bag.

For bag-mask rescue breathing, the rescuer should:

1. Position themselves at the patient's head.
2. Connect the bag-mask device to maximal oxygen flow if available.
3. Obtain and maintain an open airway.
4. Place the narrow end of the mask over the bridge of the nose.
5. Push firmly on the mask with thumb and index finger while simultaneously lifting the jaw into the mask to create a seal.

6. Hold the mask firmly in position with one hand.
7. Blow air into the patient's lungs by compressing the ventilation bag.
8. Look for a rise in the patient's chest.
9. Allow for expiration, observing for fall of the chest wall.
10. Two hands may be required to hold the mask in place, in which case, a second person may be employed to compress the ventilation bag.



*Figure 4: Correct placement of mask*



*Single operator technique  
(nose to chin)*



*Double operator technique*

## **Circulation**

Chest compressions are a vital part of resuscitation attempts. Some studies suggest that if rescuers are inexperienced, resuscitation with chest compression alone may be as good as traditional resuscitation inclusive of rescue breathing<sup>5</sup>.

Rescuers should start chest compressions no signs of life are apparent (unconscious, unresponsive, not moving, not breathing normally). Prolonged attempts to detect a pulse should not occur—in the past this has delayed initiation of chest compressions.

Some guidelines suggest that a precordial thump might be useful before initiation of chest compressions. The Australian Resuscitation Council and the International Liaison Committee on Resuscitation (ILCOR) guidelines for adult BLS recommend that a precordial thump 'should be considered within the first 15 seconds of a monitored arrest if a defibrillator is not immediately available'<sup>6, 7</sup>.

To deliver a precordial thump, the rescuer should:

1. Make a clenched fist 25–30 cm above the patient’s chest.
2. Strike the patient in the mid-sternum sharply with the side of the fist.



*Figure 5: Precordial Thump*

Proper technique for chest compression is important. This should include:

1. Positioning of the hands: on the lower half of the sternum, that is, the lower half of the chest in the midline.
2. The heel of the hand exerts pressure on the lower sternum, with the fingers parallel to the ribs and lifted off the chest wall.
3. The rescuer’s arms should be straight, with the elbows locked in extension.
4. The rescuer’s shoulders should be directly above the sternum.
5. The rescuer’s upper body—not their arms—exerts compression force.
6. The lower half of the sternum should be depressed by one-third of the depth of the chest (approximately 4–5 cm).
7. Chest compressions should be delivered at a rate of 100 per minute.

Chest compressions and rescue breathing should continue at a ratio of 30:2.



*Figure 6: Correct hand position*



*Correct body position*

## Learning activities

Suggested learning activities and timetable are outlined below.

Timing	Activity	Objective
40 minutes	Facilitated discussion	1, 2 and 3
60 minutes	Skills stations (three) <ul style="list-style-type: none"> <li>■ airway management</li> <li>■ bag-mask ventilation</li> <li>■ chest compressions</li> </ul>	4 5 6
10 minutes	Summary	All
10 minutes	Evaluation	

**Total time = 2 hours**

### Facilitated discussion

The facilitator should lead a discussion amongst participants about the issues covered in the background information, for example, indications for BLS, basic airway manoeuvres, chest compression technique and so on. The facilitator should not give a didactic lecture, but instead promote open discussion and knowledge sharing amongst participants. Participants should be encouraged to describe any real-life experiences they have encountered.

Major issues which the facilitator should cover include:

- indications for BLS
- institution-specific policies for activating the cardiac arrest team
- techniques for obtaining an adequate airway
- when to consider cervical spine injury
- techniques for providing assisted ventilation
- correct chest compression technique.

PowerPoint slides are available for the facilitator to use to summarise these main points at the end of the discussion, or as triggers for discussion if these were not identified by participants.

### Skills stations

The skills stations allow participants to practise their BLS skills (airway, breathing and chest compressions) on appropriate models, while receiving feedback in a structured format from peers and/or facilitators.



This activity, and the resources outlined, assume three facilitators for every 12 participants, a ratio of 1:4. Each facilitator should have access to one manikin suitable for teaching airway, breathing and chest compression skills, for example, 'Resus Anne' or similar. A second airway manikin is desirable, to allow participants not directly being instructed or observed to practise before or after their turn.

Participants should be guided through the three BLS skills (airway, ventilation and chest compressions) using Peyton's four-step model<sup>10</sup>. Feedback should be provided at the completion of the skill. Each participant should spend 20 minutes on airway, 20 minutes on breathing and 20 minutes on chest compressions.

## Summary

The summary session reinforces content covered in the learning activities, and is an opportunity for participants to reflect on what they have learned. No new material should be introduced.

Major points to recap in the summary include:

- indications for BLS
- the importance of:
  - activating cardiac arrest team
  - airway management techniques
  - achieving adequate ventilation
  - adequate chest compressions.

Participants should be encouraged to review the appropriate Australian Resuscitation Council Guidelines in their own time to reinforce the skills acquired in this module. They should be offered access to equipment and educators in the future to allow them to practise these skills if they need to improve their skill level or confidence. Participants might also be encouraged to attend and observe a real-life cardiac arrest in order to put these skills into a clinical context.

## Evaluation

A formal evaluation has been specifically developed for this module. It incorporates the objectives of the module and the perceptions of the participants about whether they have increased their understanding by working through the module. It is highly recommended that this formal evaluation be copied and completed by all participants at the completion of the module.

A range of informal evaluation tools may also be used in conjunction with this evaluation throughout the module, including those available in the Department of Human Services' *Clinical Skills Facilitators Manual* from the basic course conducted in 2007.

## References

1. Australian Resuscitation Council, Guideline 4: Airway. February 2006
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3. Arend C. 2000 Transmission of Infectious Diseases Through Mouth-to-Mouth Ventilation: Evidence-Based or Emotion-Based Medicine? *Arq Bras Cardiol* 74: 86–97
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9. International Liaison Committee on Resuscitation 2005 Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Part 2: Adult Basic Life Support. *Circulation* 2005 112: iii\_5–iii\_16
10. Peyton J. 1998 *Teaching and Learning in Medical Practice*. Manticore Europe Ltd. Great Britain

## Resources

### Facilitator feedback form

The following form should be used to assist you to give feedback after each participant has practised their BLS skills at the skill station.

### Feedback using the Pendleton model

Pendleton’s model of feedback assists learners to maximize their potential at different stages of training, raise their awareness of strengths and areas for improvement, and identify actions to be taken to improve performance. Pendleton’s rules are structured in such a way that the learner identifies the positives first, in order to create a safe environment. This is followed by the facilitator or group reinforcing these positives and discussing skills to achieve them. Different techniques are then suggested. The advantage of this method is that the learner’s strengths are discussed first. Avoiding a discussion of weaknesses right at the beginning prevents defensiveness and allows reflective behaviour in the learner.

Below is a series of questions to assist you in this technique:

1. Ask the learner how they feel.
2. Ask the learner what went well and why (this can be combined with question 1 and 3).
3. Tell the learner what went well and why.
4. Ask the learner what could have been done better and why.
5. Tell the learner what could have been done better and why.
6. Summarise the learner’s strengths and identify up to three things to concentrate on.

Note: This form does not need to be given to the participant — it is a guide for you, the group facilitator.

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## Module 1: Airway, Breathing and Chest Compression (ABC)— evaluation

Thank you for participating in this module. As part of our commitment to quality improvement the following questionnaire will be used to plan future implementation of this module. We appreciate your time completing this evaluation.

### 1. Overall

How would you rate this module?

poor     fair     good     very good     outstanding

### 2. Learning objectives

Please consider whether this module was successful in meeting the following learning objectives:

<i>BLS adult</i> Learning objectives of Module 1: ABC	Strongly disagree	Disagree	Slightly agree	Agree	Strongly agree
Reviewed the Australian Resuscitation Council (ARC) Guidelines for BLS (adult)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Identified the indications for BLS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Identified local processes by which their own hospital's cardiac arrest team is mobilised	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practised basic airway manoeuvre techniques on a manikin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practised rescue breathing on a manikin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practised external cardiac compressions on a manikin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### 3. Important learning outcomes

What are the three most important things you have learned from this module?

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## 4. Module implementation

Please indicate to what extent you agree or disagree with each of the following statements in relation to the implementation of the module.

	Strongly disagree	Disagree	Slightly agree	Agree	Strongly agree
The facilitator respected my experience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The facilitator encouraged my participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I was able to ask the facilitator questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The facilitator was able to answer my questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The feedback I received was clear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The feedback I received will assist me in my future performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There was adequate time for the skills stations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There was adequate time for the facilitated discussions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There was adequate time for the simulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have increased my confidence in performing BLS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have identified future learning needs in this topic area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## 5. Future module implementation

Do you think the module should be altered in any way?  yes  no

If yes, what recommendations do you have?

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**Thank you**

## PowerPoint presentation

1. **Clinical Skills in Hospitals Project**

**Basic Life Support (BLS) ADULT MODULE 1 'ABC'**


2. **Indications for BLS**

  - No signs of life
  - Unconscious
  - Unresponsive
  - Not moving
  - Not breathing normally
3. **Airway Management**

  - Clear mouth and airway
  - Head tilt / chin lift
  - Jaw thrust
  - Oro-pharyngeal airway
4. **Assisted Ventilation**

  - Mouth-to-mask
  - Bag-mask
  
  - Unobstructed airway
  - Good seal
  - Observe rise and fall of chest
5. **Chest Compression**

  - Most important aspect of BLS
  - Lower half of sternum
  - Straight arms, locked elbows
  - Depress 1/3 chest depth
  - 100 per minute
  
  - 30:2 ratio compression:ventilation

# Module 2: Automatic External Defibrillator (AED)

## Introduction

*BLS adult* (basic life support) was developed as a teaching and learning tool for Victorian clinical educators. The information contained in each module was developed using evidence-based resources and examples of best practice. Where expert opinion varies, a discussion section is included. However, it is not within the scope of ALS paediatric to address the full spectrum of local variations. Variations can occur in several areas, including practices relating to types of equipment used, infection control processes, practice guidelines and so on. Therefore, educators should, where appropriate, adapt content to reflect their local policies, procedures and protocols. This will ensure the relevancy of the package content to your learners.

The modules are designed to be discrete courses in their own right. They are timetabled so they can be completed in a 1–2 hour timeframe. This timeframe was chosen after we received feedback from clinical educators requesting shorter courses, because health professionals often have limited time to educate away from patients. However, the packages may also be combined into a one- or two-day course, as described in the Module outline.

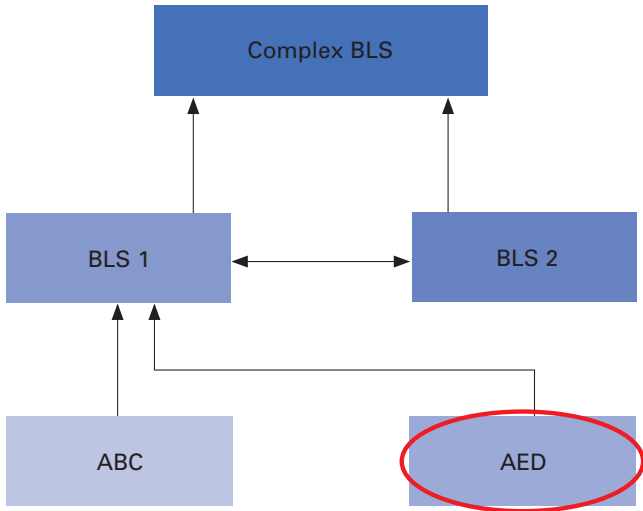
*BLS adult* should be used as an educational tool to assist in the teaching of clinical skills. It is structured as a guide to assist clinical educators, and uses many concepts taught in the Clinical Skills in Hospitals Project (Train-the-Trainer courses). Educators are encouraged to build on this resource by adding their own scenarios which incorporate hospital/health service protocols, policies and other resources. Each module is designed as a lesson plan to incorporate the simulations into the teaching of clinical skills.

## Aims

*BLS adult* aims to make participants confident in their application of basic life support (BLS) knowledge and skills on adults in different environments and settings.

## Package structure

*BLS adult* contains five modules which provide learning opportunities for health professionals at all levels of experience from medical and nursing disciplines. Modules 1 and 2 are regarded as fundamental. Modules 3 and 4 are more difficult, and are regarded as intermediate. Module 5 is more advanced and regarded as complex.

Level of complexity	Package structure
<p><b>Complex</b> For participants with more than 4 years experience or who have completed Modules 1–4</p>	 <pre> graph TD     ABC[ABC] --&gt; BLS1[BLS 1]     AED[AED] --&gt; BLS1     AED --&gt; BLS2[BLS 2]     BLS1 &lt;--&gt; BLS2     BLS1 --&gt; ComplexBLS[Complex BLS]     BLS2 --&gt; ComplexBLS   </pre>
<p><b>Intermediate</b> For participants in postgraduate years 3–4 or who have completed Modules 1 and 2</p>	
<p><b>Fundamental</b> For participants in postgraduate years 1–2</p>	

BLS (basic life support) includes basic airway management skills, rescue breathing techniques, external cardiac compressions and use of the automatic external defibrillator.

*BLS adult* was designed to develop participants' knowledge, skills and behaviours in BLS and to expose them to increasingly complex scenarios aimed at testing their ability to combine these individual skills, work as a team and problem solve in more difficult situations.

Educators delivering these modules should be aware of participants' level of experience and choose appropriate modules. Modules presume an increasing level of knowledge as they progress, ranging from a fundamental knowledge of anatomy and physiology for the fundamental modules, up to detailed knowledge of ALS and resuscitation for the complex modules. Novice participants (such as first-year graduates) are expected to start with the fundamental modules, and only move onto intermediate and more complex modules as they demonstrate proficiency. More experienced participants may start at the intermediate level if the educator is satisfied that they have the prior knowledge and skills. Individual educators are responsible for assessing each participants' baseline knowledge and determining which modules they need to complete. More specific descriptions of presumed knowledge are outlined in each module.



The design of these packages presumes that the clinical educators using them have knowledge and expertise in current best practice regarding the teaching of clinical skills and conducting facilitated discussions. Knowledge and expertise are presumed commensurate with the Department of Human Services' basic and advanced Train-the-Trainer programs. Clinical educators are encouraged to refer to Department of Human Services' *Clinical Skills Facilitators Manual* for theory on:

1. Peyton's model for teaching clinical skills
2. leading small group discussions
3. giving feedback
4. crisis resource management skills.



# Module 2: Automatic External Defibrillator (AED)

Authors: Dr Stuart Dilley, Ms Debbie Paltridge

## Aims

The purpose of *BLS adult—Module 2: AED* is to learn how to safely use an automatic external defibrillator (AED) in the setting of adult basic life support (BLS).

## Presumed knowledge

This module is targeted to health professionals with little or no experience in BLS or defibrillation. However, they are expected to have a basic knowledge of:

1. cardiovascular anatomy: heart, peripheral pulses
2. cardiovascular physiology: blood pressure, circulation, cardiac electrophysiology and conduction.

## Objectives

By the end of this module, participants should have:

1. analysed the clinical indications for the use of the AED
2. recognised ventricular fibrillation (VF) and ventricular tachycardia (VT) using sample rhythm strips
3. discussed the functionality of the AED
4. demonstrated the use of the AED safely in a simulated environment.

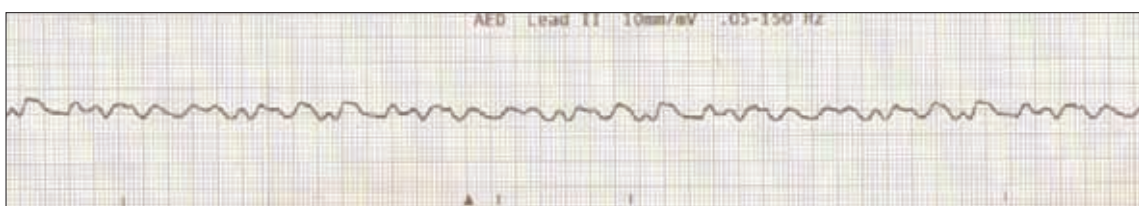
## Background information for educators

Defibrillation is the only intervention of proven benefit for patients in cardiac arrest. It is most effective if delivered within the first minute of a cardiac arrest. The probability of successful defibrillation diminishes rapidly over time, and VF tends to deteriorate to asystole in minutes<sup>1</sup>.

Defibrillation is the delivery of an electrical charge to the heart. This charge stops all electrical activity in the heart, allowing the normal pacemaker of the heart (the sino-atrial (SA) node) or another part of the heart to 'reset' and initiate a more normal rhythm.

Defibrillation is indicated in cases of:

1. ventricular fibrillation (VF)



## 2. pulseless ventricular tachycardia (VT)



Both these rhythms are a result of chaotic electrical activity in the heart, and are lethal if not treated. These patients will be unconscious, not breathing normally, and have no detectable pulse or signs of life. Some patients in VT may still be conscious and have a pulse. These patients should not be defibrillated unless they become unconscious.

Defibrillator use was traditionally confined to medical institutions and services and used by a small group of professionals. Simple-to-use AEDs have enabled those working outside such institutions, or those with limited skills, to perform defibrillation safely on appropriate patients. The use of AEDs in the community by laypersons is associated with an increased survival rate from out-of-hospital cardiac arrest<sup>2</sup>. This is reflected in the current Australian Resuscitation Council (ARC)<sup>3</sup> and American Heart Association/International Liaison Committee on Resuscitation (AHA/ILCOR)<sup>4</sup> guidelines describing AED use as a BLS skill.

While identification of VF and VT is not necessary to deploy the AED successfully, this module covers recognition of these rhythms, and is a good primer. The skill is useful for appropriate participants who subsequently undertake the advanced life support module.

The AED:

1. automatically prompts the user regarding intervention
2. automatically interprets the heart rhythm
3. advises and prompts the user to deliver a shock only if needed.

The AED delivers an electrical charge to the patient at either 150 j or 200 j, depending on the brand of defibrillator. Some AEDs have a manual override feature allowing responders with greater skill to have more control over defibrillation.

The AED should be connected to the patient once they are determined unconscious, not breathing normally and show no signs of life. Follow these steps:

1. Turn on the AED.
2. Apply the electrode pads to the patient's chest as indicated by the icons: one below the right clavicle near the right sternal border, the other over the left sixth intercostal space, mid-axillary line.
3. Plug the pads into defibrillator unit.

4. The AED automatically assesses the patient's rhythm. Do not touch the patient.
5. The AED analysis will advise either: 'shock' or 'no shock'.
6. If the AED advises 'shock', do not touch the patient and advise all others to stand clear. Check for clearance visually.
7. Push the 'shock' button when advised and follow the subsequent prompts.
8. If the AED advises 'no shock', the patient may still require cardiopulmonary resuscitations (CPR).

The AED has the potential to harm the user, bystanders or the patient. Responders using the AED should be aware of these risks:

1. Avoid placing electrodes over implanted pacemakers or defibrillators. These devices may be damaged by the defibrillation charge.
2. Avoid touching the patient during defibrillation. Ensure that everyone stands clear when discharging the defibrillator so that no rescuers are inadvertently shocked.
3. Do not shock the patient unless advised to by the AED. Attempts at defibrillation may worsen the patient's condition if they are not in VT or VF.
4. Avoid discharging in the presence of flammable materials (for example, petrol, gas, alcohol and oxygen), because sparks and fires may result.
5. Remove medication patches from patient's chest before defibrillation because these may also lead to sparks and burns.

## Learning activities

Suggested learning activities and timetable are outlined below.

Timing	Activity	Objective
40 minutes	Facilitated discussion	1 and 2
45 minutes	Skills station: practice of AED use	2, 3 and 4
10 minutes	Summary	All
10 minutes	Evaluation	

**Total time = 1 hour 45 minutes**

## Facilitated discussion

The facilitator should lead a discussion amongst participants about the issues covered in the background information, for example, the clinical indications for use of the AED, including the identification of VF and VT. The facilitator should not give a didactic lecture, but instead promote open discussion and knowledge sharing amongst participants. Participants should be encouraged to describe any real-life experiences they have encountered.

Major issues which the facilitator should cover include:

- indications and reasons for defibrillation
- recognition of VF and VT
- safety aspects of defibrillation
- AED functionality and use
- institution-specific policies regarding AED use
- location of AEDs in the institution.

PowerPoint slides are available for the facilitator to use to summarise these main points at the end of the discussion, or as triggers for discussion if the participants have not identified the major issues, including examples of VF and VT. Hard copy examples of these rhythms are also available for each participant.

## Skills station

This station allows participants to practise using the AED on a training manikin. Participants should be guided through the use of the AED using Peyton's four-step model<sup>5</sup>. Feedback should be provided at the completion of the skill.

This activity, and the resources outlined below, assume three facilitators for every 12 participants, a ratio of 1:4. Each facilitator should have access to one manikin suitable for teaching defibrillation (able to simulate VF and receive a defibrillation shock) and an AED or AED simulator. Each participant should have approximately 11 minutes of hands-on experience while observing three colleagues for approximately 33 minutes.

## Summary

The summary session reinforces content covered in the learning activities, and is an opportunity for participants to reflect on what they have learned. No new material should be introduced.

Major points to recap in the summary include:

- indications and reasons for defibrillation
- recognition of VF and VT

- safety aspects of defibrillation
- AED functionality and use
- institution-specific policies regarding AED use
- location of AEDs in the institution.

Participants should be encouraged to review the appropriate ARC Guidelines in their own time to reinforce the skills acquired in this module. They should be offered access to equipment and educators in the future to allow them to practise these skills if they need to improve their skill level or confidence. Participants might also be encouraged to attend and observe a real-life cardiac arrest in order to put these skills into a clinical context.

## Resource list

The following resource list assumes three facilitators for every 12 participants, a ratio of 1:4. As a minimum, the following resources are needed to conduct this module.

Resource	Quantity	Additional comments
Facilitators	3	Allows 1:4 ratio with 12 participants
ARC Guideline 11.5: Electrical Therapy for Advanced Life Support, February 2006	1	For educator's reference as needed
Hospital AED protocol	1	If different from ARC Guidelines For educator's reference
AED	3	Including product manual for troubleshooting
AED pads	3	
Manikin	3	Manikins (or AED simulator) capable of simulating VF/VT and receptive to defibrillation
Example VF/VT	12	One for each participant
Feedback sheets	3	As a prompt for each facilitator
Evaluation forms	12	One for each participant
PowerPoint presentation	1	Provided with module

## Evaluation

A formal evaluation has been specifically developed for this module. It incorporates the objectives of the module and the perceptions of the participants about whether they have increased their understanding by working through the module. It is highly recommended that this formal evaluation be copied and completed by all participants at the completion of the module.

A range of informal evaluation tools may also be used in conjunction with this evaluation throughout the module, including those available in the Department of Human Services' *Clinical Skills Facilitators Manual* from the basic course conducted in 2007.

## References

1. American Heart Association 2005 Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Part 5: Electrical Therapies. Automated External Defibrillators, Defibrillation, Cardioversion and Pacing. *Circulation* 2005 112: iiv\_35–iv\_46
2. Hallstrom A. and Ornato J. 2004 Public-Access Defibrillation and Survival after out-of-Hospital Cardiac Arrest. *N Eng J Med* 351: 637–646
3. Australian Resuscitation Guideline 11.5: Electrical Therapy for Advanced Life Support. February 2006
4. American Heart Association 2005 Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Part 2: Adult Basic Life Support. *Circulation* 2005 112: iii\_5–iii\_16
5. Peyton J. 1998 *Teaching and Learning in Medical Practice*. Manticore Europe Ltd. Great Britain





## Module 2: Automatic External Defibrillator (AED)— evaluation

Thank you for participating in this module. As part of our commitment to quality improvement the following questionnaire will be used to plan future implementation of this module. We appreciate your time completing this evaluation.

### 1. Overall

How would you rate this module?

poor     fair     good     very good     outstanding

### 2. Learning objectives

Please consider whether this module was successful in meeting the following learning objectives:

<i>BLS adult</i> Learning objectives of Module 2: AED	Strongly disagree	Disagree	Slightly agree	Agree	Strongly agree
Analysed the clinical indication for the use of the AED	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recognised ventricular fibrillation (VF) and ventricular tachycardia (VT) using sample rhythm strips	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discussed the functionality of the AED	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demonstrated the use of the AED safely in a simulated environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### 3. Important learning outcomes

What are the three most important things you have learned from this module?

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## 4. Module implementation

Please indicate to what extent you agree or disagree with each of the following statements in relation to the implementation of the module.

	Strongly disagree	Disagree	Slightly agree	Agree	Strongly agree
The facilitator respected my experience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The facilitator encouraged my participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I was able to ask the facilitator questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The facilitator was able to answer my questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The feedback I received was clear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The feedback I received will assist me in my future performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There was adequate time for the skills stations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There was adequate time for the facilitated discussions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There was adequate time for the simulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have increased my confidence in performing BLS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have identified future learning needs in this topic area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## 5. Future module implementation

Do you think the module should be altered in any way?  yes  no

If yes, what recommendations do you have?

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**Thank you**

## PowerPoint presentation

- Clinical Skills in Hospitals Project**

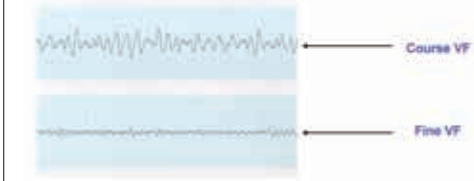
**Basic Life Support (BLS) ADULT MODULE 2 'AED'**


- Module Outline**


  - Discussion
  - Skills stations
    - AED use
  - Summation
  - Evaluation
- Indications for AED**

  - Ventricular fibrillation
  - Pulseless ventricular tachycardia
- Ventricular Fibrillation**

3 lead rhythm strips of Ventricular Fibrillation (VF)


- Ventricular Tachycardia**

3 lead strips of Ventricular Tachycardia (VT)


- AED Safety**

  - Don't touch patient
  - Follow instructions
  - Implanted pacemakers / defibrillators
  - Fire risks

# Module 3: BLS 1

## Introduction

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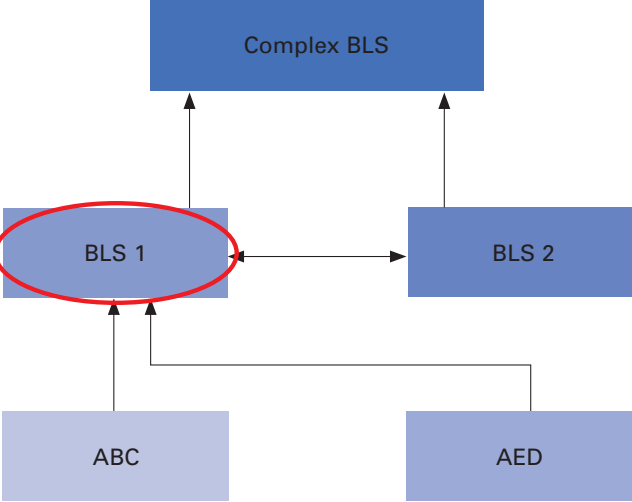
*BLS adult* should be used as an educational tool to assist in the teaching of clinical skills. It is structured as a guide to assist clinical educators, and uses many concepts taught in the *Clinical Skills in Hospitals Project* (Train-the-Trainer courses). Educators are encouraged to build on this resource by adding their own scenarios which incorporate hospital/health service protocols, policies and other resources. Each module is designed as a lesson plan to incorporate the simulations into the teaching of clinical skills.

## Aims

*BLS adult* aims to make participants confident in their application of basic life support (BLS) knowledge and skills on adults in different environments and settings.

## Package structure

*BLS adult* contains five modules which provide learning opportunities for health professionals at all levels of experience from medical and nursing disciplines. Modules 1 and 2 are regarded as fundamental. Modules 3 and 4 are more difficult, and are regarded as intermediate. Module 5 is more advanced and regarded as complex.

Level of complexity	Package structure
<p><b>Complex</b> For participants with more than 4 years experience or who have completed Modules 1–4</p>	 <pre> graph BT     ABC[ABC] --&gt; BLS1[BLS 1]     AED[AED] --&gt; BLS1     BLS1 &lt;--&gt; BLS2[BLS 2]     BLS1 --&gt; ComplexBLS[Complex BLS]     BLS2 --&gt; ComplexBLS   </pre>
<p><b>Intermediate</b> For participants in postgraduate years 3–4 or who have completed Modules 1 and 2</p>	
<p><b>Fundamental</b> For participants in postgraduate years 1–2</p>	

BLS (basic life support) includes basic airway management skills, rescue breathing techniques, external cardiac compressions and use of the automatic external defibrillator.

*BLS adult* was designed to develop participants' knowledge, skills and behaviours in BLS and to expose them to increasingly complex scenarios aimed at testing their ability to combine these individual skills, work as a team and problem solve in more difficult situations.

Educators delivering these modules should be aware of participants' level of experience and choose appropriate modules. Modules presume an increasing level of knowledge as they progress, ranging from a fundamental knowledge of anatomy and physiology for the fundamental modules, up to detailed knowledge of ALS and resuscitation for the complex modules. Novice participants (such as first-year graduates) are expected to start with the fundamental modules, and only move onto intermediate and more complex modules as they demonstrate proficiency. More experienced participants may start at the intermediate level if the educator is satisfied that they have the prior knowledge and skills. Individual educators are responsible for assessing each participants' baseline knowledge and determining which modules they need to complete. More specific descriptions of presumed knowledge are outlined in each module.

The design of these packages presumes that the clinical educators using them have knowledge and expertise in current best practice regarding the teaching of clinical skills and conducting facilitated discussions. Knowledge and expertise are presumed commensurate with the Department of Human Services' basic and advanced Train-the-Trainer programs. Clinical educators are encouraged to refer to Department of Human Services' *Clinical Skills Facilitators Manual* for theory on:

1. Peyton's model for teaching clinical skills
2. leading small group discussions
3. giving feedback
4. crisis resource management skills.





# Module 3: BLS 1

Authors: Dr Stuart Dilley, Ms Debbie Paltridge

## Aims

The purpose of *BLS adult—Module 3: BLS 1* is for participants to apply their basic life support (BLS) and automatic external defibrillator (AED) skills learned in the basic modules, and perform a coordinated BLS response in a controlled setting.

## Presumed knowledge

This module is targeted to health professionals who are competent in the component skills of BLS (airway, breathing and chest compressions). However, they are expected to have an intermediate level of knowledge and skills relevant to:

1. BLS protocols, including the DRABC response
2. basic airway management
3. simple rescue breathing techniques
4. external cardiac compressions
5. use of the AED.

Participants should also have practised these skills on manikins, but may not have had an opportunity to apply them to a clinical scenario. If participants do not yet feel confident with the individual skills, they should be redirected to *BLS adult—Module 1: ABC* and *Module 2: AED*.

## Objectives

By the end of this module, participants should have:

1. reviewed the Australian Resuscitation Council (ARC) BLS Guidelines for cardiac arrest in adults
2. demonstrated their ability to assess a collapsed person and determine the need for BLS
3. applied BLS skills according to the ARC principles of DRABC to a simulated patient (manikin)
4. performed team-based cardiopulmonary resuscitation (CPR) in a simulated environment
5. demonstrated the use of an AED on a simulated patient (manikin).

## Background information for educators

Much of the background information pertaining to airway, breathing and chest compressions and AED use is covered in *BLS adult—Module 1: ABC* and *Module 2: AED*. Participants undertaking *BLS adult—Module 3: BLS 1* should have previous knowledge and skills in BLS and be able to use the AED<sup>1, 2</sup>. This module allows participants to put these skills together as 'cardiopulmonary resuscitation' in a controlled team environment.

Checking for the carotid pulse is inaccurate for determining the presence of adequate circulation. Agonal gasps (ineffective, involuntary attempts at breathing) are common in the early stages of cardiac arrest<sup>1</sup>. CPR should be initiated if the patient shows no signs of life (unconscious, unresponsive, not moving and not breathing normally)<sup>2</sup>.

Initial steps in resuscitation should follow the DRABC format, and include:

1. Check for **danger**.
2. Check for **response**.
3. Open the **airway** look for signs of life.
4. Call **000** or the resuscitation team.
5. Give rescue **breathing**: two breaths.
6. Give 30 chest **compressions** followed by two breaths.
7. Attach the AED and follow the prompts.

Elements of effective CPR include<sup>1,2</sup>:

1. Avoid interruptions to chest compressions.
2. Avoid over-ventilation (which increases intrathoracic pressure and reduces blood flow).
3. Compression-to-ventilation ratio of 30:2.
4. Delivery of 5 cycles over 2 minutes.

Both lay personnel and professional health care workers often experience difficulty detecting a pulse in collapsed patients. Minimise interruption to chest compressions to maximise the likelihood of survival. Do not interrupt chest compressions to check for signs of life.

## Learning activities

Suggested learning activities and timetables are outlined below. Timetable 1 is designed for 12 participants working in two groups of six. Timetable 2 is designed for six participants working together.

Timetable 1			
Timing	Activity		Objective
20 minutes	Introduction and BLS DVD		1
	Group 1	Group 2	
10 minutes	Simulation 1	Simulation 2	All
30 minutes	Debrief	Debrief	All
10 minutes	Simulation 2	Simulation 1	All
30 minutes	Debrief	Debrief	All
10 minutes	Summary		All
10 minutes	Evaluation		

**Total time = 2 hours**

Timetable 2		
Timing	Activity	Objective
20 minutes	Introduction and BLS DVD	1
10 minutes	Simulation 1	All
30 minutes	Debrief	All
10 minutes	Simulation 2	All
30 minutes	Debrief	All
10 minutes	Summary	All
10 minutes	Evaluation	

**Total time = 2 hours**

### Introduction

The facilitator should lead a brief discussion amongst participants to refresh or clarify any issues relating to BLS protocols and to introduce the simulation training to follow. This should not be a comprehensive lecture on BLS. The ARC BLS protocols<sup>1</sup> should be displayed prominently and can also be provided to participants as a handout.

The discussion should highlight any departures from ARC Guidelines that might be peculiar to that institution. Institution-specific 'cardiac arrest call' nomenclature and phone numbers should be reinforced.

A brief DVD demonstrating an appropriate BLS response is provided as a resource.

## Simulation sessions

This exercise allows participants to practise their BLS skills as a team in a simulated environment. Participants are exposed to a mock cardiac arrest situation and are expected to manage this within the confines of BLS skills.

The program assumes two facilitators for every 12 participants. Participants should be divided into two groups of six (Timetable 1). Three participants will each participate in one scenario and observe a second. The debriefing period should include all six participants of that group, that is, the active participants and their observers. It is possible to run these scenarios with smaller groups. If only six participants are present, Simulations 1 and 2 can be run sequentially (Timetable 2).

These scenarios can be run on low-fidelity simulators (for example, Resus Anne), but are also quite suitable for more sophisticated simulators (for example, Sim Man, HPS METI).

### Simulation 1: VF arrest

Scenario design	
In this scenario, a 60-year-old male suffers a VF arrest on the general medical ward. Participants are required to recognise this, initiate CPR and deploy the AED.	
Case history	
Patient details	
Sex	Male
Age	60
Past history	Smoker Hypertension, prescribe irbesartan 150 mg daily
Social history	Married, lives at home
History of present illness	Admitted three days prior with chest infection Prescribed ceftriaxone 1 g per day, roxithromycin 300 mg per day
Presenting symptoms	Found in bed unresponsive by health professional on the general medical ward

Resources	
General	
Setting/environment	Hospital medical ward
Patient attire	Hospital gown
Monitoring	None
Supporting documentation required	Bedside drug chart, observation chart

Equipment		
Equipment	Number	Sourced from
Manikin	1	
Hospital bed/trolley	1	
Hospital gown	1	
Pillow, blanket	1 each	
Patient bedside chart	1	
Hudson mask and tubing	1	
OP airway	1	
Bag-mask device	1	
Oxygen supply	1	
AED	1	
AED pads	1 set	

Roles
<b>Participant 1</b>
You are a health professional about to review your patient on the general medical ward. You find your patient unwell and you need to initiate management. You have two colleagues to call on for assistance. Some basic resuscitation equipment and an AED are located in an adjacent room. You will need to retrieve these. You should manage the patient according to your capabilities and professional roles in real life—that is, medical, nursing or allied health in the confines of BLS skills.
<b>Participants 2 and 3</b>
You are health professionals on a general medical ward. Your colleague (Participant 1) may ask for assistance with managing a patient. If asked to help, you should manage the patient according to your capabilities and professional roles in real life—that is, medical, nursing or allied health. Some basic resuscitation equipment and an AED are located in an adjacent room. You will need to retrieve these.

**Faculty role play: Cardiac arrest team**

You are a senior medical person at the hospital, part of the hospital's cardiac arrest team. At the conclusion of the scenario, you arrive with the crash cart and prepare to take over the care of the patient. You may ask for a handover from the participants. If the participants experience difficulties, it might be appropriate to enter the scenario earlier and offer assistance.

**Simulator programming considerations**

System	Baseline state	Change in State 1	Change in State 2	Resolution
CVS	Ventricular fibrillation, pulseless	n/a*	n/a	Sinus tachycardia after three defibrillations  Return of spontaneous circulation (pulses) (assume return of pulses if low-fidelity manikin)
Respiratory	Apnoeic	n/a	n/a	Return of spontaneous respirations, RR 18 (assume return of spontaneous respiration if low-fidelity manikin)
Neurologic	Unresponsive	n/a	n/a	Return of consciousness  GCS = 14 (assume GCS 14 if low-fidelity manikin)
Response to participant intervention	No CPR then remains in baseline state  CPR and successful use of AED go to resolution	n/a	n/a	

\* For participants who perform well, the patient could be returned to VF or VT so that prolonged CPR and multiple attempts at defibrillation are needed.

Debriefing points:

- recognition of need to initiate hospital's 'cardiac arrest response'
- initiation of CPR
- effective ABC management
- effective use of AED.

## Simulation 2: Unconscious VT

### Scenario design

In this scenario, a 55-year-old woman collapses with conscious VT on the surgical ward. Participants are required to recognise this, initiate CPR and deploy the AED.

### Case history

#### Patient details

Sex	Female
Age	55
Past history	Smoker, hypertension Prescribed irbesartan 150 mg daily
Social history	Married, lives at home
History of present illness	Admitted three days earlier for bunion surgery Prescribed Panadeine Forte PRN
Presenting symptoms	Collapses to the floor on way back from toilet on the surgical ward

### Resources

#### General

Setting/environment	Hospital medical ward
Patient attire	Hospital gown, wig to indicate manikin is female
Monitoring	None
Supporting documentation required	Bedside drug chart, observation chart

### Equipment

Equipment	Number	Sourced from
Manikin	1	
Hospital bed/trolley	1	
Hospital gown	1	
Pillow, blanket	1 each	
Patient bedside chart	1	
Hudson mask and tubing	1	
OP airway	1	
Bag-mask device	1	
Oxygen supply	1	
AED	1	
AED pads	1 set	

Roles
<p><b>Participant 1</b></p> <p>You are a health professional working on the surgical ward. You discover a middle-aged woman collapsed on the floor beside her bed. You find that the patient is unwell and you need to initiate management. You have two colleagues to call on for assistance. Some basic resuscitation equipment and an AED are located in an adjacent room. You will need to retrieve these. You should manage the patient according to your capabilities and professional roles in real life—that is, medical, nursing or allied health.</p>
<p><b>Participants 2 and 3</b></p> <p>You are health professionals working on the surgical ward. Your colleague (Participant 1) may ask for assistance with managing a patient. If asked to help, you should manage the patient according to your capabilities and professional roles in real life—that is, medical, nursing or allied health. Some basic resuscitation equipment and an AED are located in an adjacent room. You will need to retrieve these.</p>
<p><b>Faculty role play: Cardiac arrest team</b></p> <p>You are a senior medical person at the hospital, part of the hospital's cardiac arrest team. At the conclusion of the scenario, you arrive with the crash cart and prepare to take over the care of the patient. You may ask for a handover from the participants. If the participants experience difficulties, it might be appropriate to enter the scenario earlier and offer assistance.</p>

Simulator programming considerations				
System	Baseline state	Change in State 1	Change in State 2	Resolution
CVS	Ventricular tachycardia, pulseless	n/a*	n/a	Sinus tachycardia after three defibrillations Return of spontaneous circulation (pulses) (assume return of pulses if low-fidelity manikin)
Respiratory	Apnoeic	n/a	n/a	Return of spontaneous respirations, RR 18 (assume return of spontaneous respiration if low-fidelity manikin)
Neurologic	Unresponsive	n/a	n/a	Return of consciousness GCS = 14 (assume GCS 14 if low-fidelity manikin)
Response to participant intervention	No CPR then remains in baseline state CPR and successful use of AED go to resolution	n/a	n/a	

\* For participants who perform well, the patient could be returned to VF or VT so that prolonged CPR and multiple attempts at defibrillation are needed.



Debriefing points:

- recognition of need to initiate hospital's 'cardiac arrest response'
- initiation of CPR
- effective ABC management
- effective use of AED.

### **Summary**

The summary session reinforces content covered in the learning activities, and is an opportunity for participants to reflect on what they have learned. No new material should be introduced.

Major points to recap in the summary include:

- assessment of the collapsed person
- DRABC steps of BLS
- compression-to-ventilation ratios
- coordination of resuscitation efforts
- safe and appropriate use of AED.

Participants should be encouraged to review the appropriate ARC Guidelines in their own time to reinforce the skills acquired in this module. They should be offered access to equipment and educators in the future if they need to practise or improve their skill level or confidence. Participants might also be encouraged to attend and observe a real-life cardiac arrest in order to put these skills into a clinical context.

## Resource list

The following resource list assumes two facilitators for every 12 participants. As a minimum, the following resources are needed to conduct this module.

Resource	Quantity	Additional comments
Facilitators	2	Allows one facilitator per simulation
ARC BLS flowchart	1	For display in tutorial area
ARC BLS flowchart handout	12	One for each participant
Hospital BLS protocol	1	Only if different from ARC Guidelines
CPR DVD	1	For viewing during introduction
Hospital AED protocol	1	For educator's reference
Manikins	2	Suitable for airway management, and capable of simulating VF/VT and receptive to defibrillation
Oropharyngeal airways	2	One for each manikin
Oxygen supply	2	May be piped or bottled
Bag-mask ventilation devices	2	
AED	2	
AED pads	2 sets	
Feedback forms	2	As prompt for each facilitator
Evaluation forms	12	One for each participant

## Evaluation

A formal evaluation has been specifically developed for this module. It incorporates the objectives of the module and the perceptions of the participants about whether they have increased their understanding by working through the module. It is highly recommended that this formal evaluation be copied and completed by all participants at the completion of the module.

A range of informal evaluation tools may also be used in conjunction with this evaluation throughout the module, including those available in the Department of Human Services' *Clinical Skills Facilitators Manual* from the basic course conducted in 2007.

## References

1. American Heart Association 2005 Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Part 2: Adult Basic Life Support. *Circulation* 2005 112: iii\_5–iii\_16
2. Australian Resuscitation Council Guideline 7: Cardiopulmonary Resuscitation. February 2006.



## Module 3: BLS 1—evaluation

Thank you for participating in this module. As part of our commitment to quality improvement the following questionnaire will be used to plan future implementation of this module. We appreciate your time completing this evaluation.

### 1. Overall

How would you rate this module?

poor     fair     good     very good     outstanding

### 2. Learning objectives

Please consider whether this module was successful in meeting the following learning objectives:

<i>BLS adult</i> Learning objectives of Module 3: BLS1	Strongly disagree	Disagree	Slightly agree	Agree	Strongly agree
Reviewed the Australian Resuscitation Council (ARC) BLS Guidelines for cardiac arrest in adults	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demonstrated their ability to assess a collapsed person and determine the need for BLS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Applied BLS skills according to the ARC principles of DRABC to a simulated patient (manikin)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Performed team-based cardiopulmonary resuscitation (CPR) in a simulated environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demonstrated the use of an AED on a simulated patient (manikin)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### 3. Important learning outcomes

What are the three most important things you have learned from this module?

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## 4. Module implementation

Please indicate to what extent you agree or disagree with each of the following statements in relation to the implementation of the module.

	Strongly disagree	Disagree	Slightly agree	Agree	Strongly agree
The facilitator respected my experience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The facilitator encouraged my participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I was able to ask the facilitator questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The facilitator was able to answer my questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The feedback I received was clear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The feedback I received will assist me in my future performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There was adequate time for the skills stations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There was adequate time for the facilitated discussions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There was adequate time for the simulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have increased my confidence in performing BLS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have identified future learning needs in this topic area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## 5. Future module implementation

Do you think the module should be altered in any way?  yes  no

If yes, what recommendations do you have?

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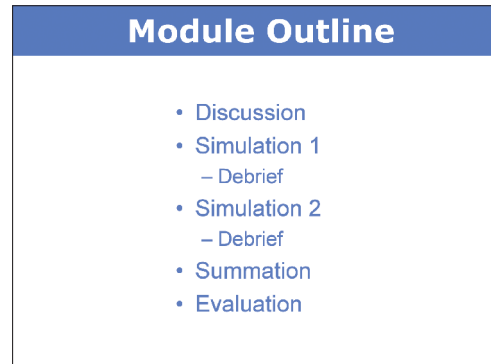
**Thank you**

## PowerPoint presentation

1.



2.







# Module 4: BLS 2

## Introduction

*BLS adult* (basic life support) was developed as a teaching and learning tool for Victorian clinical educators. The information contained in each module was developed using evidence-based resources and examples of best practice. Where expert opinion varies, a discussion section is included. However, it is not within the scope of ALS paediatric to address the full spectrum of local variations. Variations can occur in several areas, including practices relating to types of equipment used, infection control processes, practice guidelines and so on. Therefore, educators should, where appropriate, adapt content to reflect their local policies, procedures and protocols. This will ensure the relevancy of the package content to your learners.

The modules are designed to be discrete courses in their own right. They are timetabled so they can be completed in a 1–2 hour timeframe. This timeframe was chosen after we received feedback from clinical educators requesting shorter courses, because health professionals often have limited time to educate away from patients. However, the packages may also be combined into a one- or two-day course, as described in the Module outline.

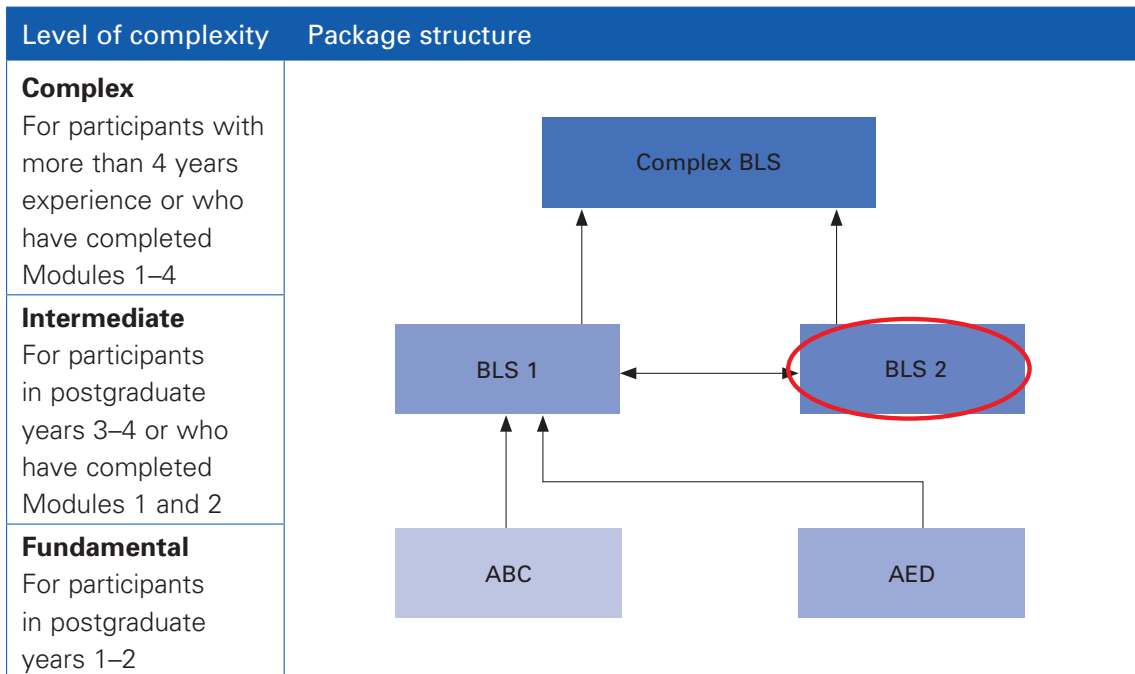
*BLS adult* should be used as an educational tool to assist in the teaching of clinical skills. It is structured as a guide to assist clinical educators, and uses many concepts taught in the *Clinical Skills in Hospitals Project* (Train-the-Trainer courses). Educators are encouraged to build on this resource by adding their own scenarios which incorporate hospital/health service protocols, policies and other resources. Each module is designed as a lesson plan to incorporate the simulations into the teaching of clinical skills.

## Aims

*BLS adult* aims to make participants confident in their application of basic life support (BLS) knowledge and skills on adults in different environments and settings.

## Package structure

*BLS adult* contains five modules which provide learning opportunities for health professionals at all levels of experience from medical and nursing disciplines. Modules 1 and 2 are regarded as fundamental. Modules 3 and 4 are more difficult, and are regarded as intermediate. Module 5 is more advanced and regarded as complex.



BLS (basic life support) includes basic airway management skills, rescue breathing techniques, external cardiac compressions and use of the automatic external defibrillator.

*BLS adult* was designed to develop participants' knowledge, skills and behaviours in BLS and to expose them to increasingly complex scenarios aimed at testing their ability to combine these individual skills, work as a team and problem solve in more difficult situations.

Educators delivering these modules should be aware of participants' level of experience and choose appropriate modules. Modules presume an increasing level of knowledge as they progress, ranging from a fundamental knowledge of anatomy and physiology for the fundamental modules, up to detailed knowledge of ALS and resuscitation for the complex modules. Novice participants (such as first-year graduates) are expected to start with the fundamental modules, and only move onto intermediate and more complex modules as they demonstrate proficiency. More experienced participants may start at the intermediate level if the educator is satisfied that they have the prior knowledge and skills. Individual educators are responsible for assessing each participants' baseline knowledge and determining which modules they need to complete. More specific descriptions of presumed knowledge are outlined in each module.

The design of these packages presumes that the clinical educators using them have knowledge and expertise in current best practice regarding the teaching of clinical skills and conducting facilitated discussions. Knowledge and expertise are presumed commensurate with the Department of Human Services' basic and advanced Train-the-Trainer programs. Clinical educators are encouraged to refer to Department of Human Services' *Clinical Skills Facilitators Manual* for theory on:

1. Peyton's model for teaching clinical skills
2. leading small group discussions
3. giving feedback
4. crisis resource management skills.



# Module 4: BLS 2

Authors: Dr Stuart Dilley, Ms Debbie Paltridge

## Aims

The purpose of *BLS adult—Module 4: BLS 2* is for participants to apply their basic life support (BLS) and automatic external defibrillator (AED) skills learned in the basic modules to practise and perform a coordinated BLS response in a more difficult clinical setting.

## Presumed knowledge

This module is targeted to health professionals with some experience in BLS. However, they are expected to have an intermediate level of knowledge and skills relevant to:

1. BLS protocols, including the DRABC response
2. basic airway management
3. simple rescue breathing techniques
4. external cardiac compressions
5. use of the AED.

Participants should also have practised these skills on manikins, and had an opportunity to apply them to the clinical scenario in *BLS adult—Module 3: BLS 1*. If participants do not yet feel confident with the individual skills, they should be redirected to *BLS adult—Module 1: ABC, Module 2: AED and Module 3: BLS 1*.

## Objectives

By the end of this module, participants should have:

1. reviewed the Australian Resuscitation Council (ARC) BLS Guidelines<sup>1</sup> for cardiac arrest in adults
2. demonstrated their ability to assess a simulated patient (manikin) mimicking a collapsed person and determine the need for BLS
3. applied BLS skills according to the ARC principles of DRABC in a simulated environment
4. performed team-based cardiopulmonary resuscitation (CPR) in a difficult clinical setting
5. demonstrated the use of an AED in a difficult clinical setting.

## Background information for educators

Much of the background information pertaining to airway, breathing and chest compressions and AED use is covered in *BLS adult—Module 1: ABC* and *Module 2: AED*. Participants undertaking *BLS adult—Module 4: BLS 2* should have previous knowledge and skills in BLS and be able to use the AED<sup>1, 2, 3</sup>. Participants should have also undertaken the simulation exercise in *BLS adult—Module 3: BLS 1*, a straightforward CPR scenario. This module allows participants to use these skills in a more difficult clinical scenario.

Performing CPR and deploying the AED in unusual environments may be problematic or technically difficult, and may be associated with unique risks.

Sparks and fires were reported when poorly applied defibrillator paddles were used in oxygen-rich environments<sup>4</sup>. The fire flash rushes over the oxygen-rich environment, often without burning the skin until it meets an 'edge', such as a fold of clothing or bed linen. The most severe fires were reported when ventilator tubing was disconnected from the tracheal tube and left adjacent to the patient's head. Recommendations describe how, if detached from the patient, oxygen sources should be moved to a distance of one metre (1 m) from the defibrillation paddles<sup>5, 6</sup>. Case reports also exist describing fires during defibrillation in the presence of GTN patches. These concerns stem from reports in the 1990s, and were probably related to the aluminium backing used in those patches<sup>7</sup>. GTN patches are no longer manufactured with aluminium backing.

If the patient is wet, or is in a wet environment, potential exists for the electric charge to travel preferentially outside the body. This would reduce the amount of charge actually delivered to the patient's heart, and may result in unsuccessful defibrillation. Risk of electric shock to the rescuer is also possible. Most recommendations include removing the patient from water or pools of water and drying the chest before attempts at defibrillation. By using an AED, rescuers can defibrillate without touching the patient. Manufacturer safety studies show that minimal voltages (< 3 volts) are detected in the surrounding wet environment<sup>8</sup>.

External defibrillation can still be performed in patients who have permanent implantable pacemakers or defibrillators. In this case, defibrillation paddles should be placed away from these devices to avoid damaging them<sup>9</sup>.

Rescuers should consider the risk of cervical spine injury in patients who have sustained trauma before or due to their collapse. Cervical spine immobilisation, chin lift (compared to head tilt) and careful rescue breathing can be employed to minimise movement to the cervical spine. Patients may need to be moved to allow access for multiple rescuers and to perform efficient BLS. Determining the risk of cervical spine injury may be difficult, and patients may be at higher risk in the following circumstances<sup>10, 11, 12</sup>.

- when they are aged over 64
- after a fall from a height greater than a body length
- if signs of injury are present (especially facial trauma and head injury)
- if evidence of diving exists
- after a motor vehicle accident.

Occasionally, less experienced or lay personnel might need to be recruited to assist in BLS. These people should be assigned to the least complex tasks, for example, chest compression, rather than bag-mask ventilation. If the number of rescuers is limited, chest compression is the most important task to perform while waiting for the AED<sup>1, 11</sup>.

Health professionals practising in areas outside the hospital environment should have protocols and policies in place to deal with a collapsed patient in different environments, for example, the patient's home. Educators should be familiar with these institution-specific protocols.

## Learning activities

Suggested learning activities and timetables are outlined below. Timetable 1 is designed for 12 participants working in two groups of six. Timetable 2 is designed for six participants working together.

Timetable 1			
Timing	Activity		Objective
20 minutes	Facilitated discussion		1
	Group 1	Group 2	
15 minutes	Simulation 1	Simulation 2	All
25 minutes	Debrief	Debrief	All
15 minutes	Simulation 2	Simulation 1	All
25 minutes	Debrief	Debrief	All
10 minutes	Summary		All
10 minutes	Evaluation		

**Total time = 2 hours**

Timetable 2		
Timing	Activity	Objective
20 minutes	Facilitated discussion	1
15 minutes	Simulation 1	All
25 minutes	Debrief	All
15 minutes	Simulation 2	All
25 minutes	Debrief	All
10 minutes	Summary	All
10 minutes	Evaluation	

**Total time = 2 hours**

### Facilitated discussion

The facilitator should lead a brief discussion amongst participants to refresh or clarify issues about BLS protocols and to introduce the simulation training to follow. This should not be a comprehensive lecture on BLS. The clinical settings for these scenarios are more difficult than those in *BLS adult—Module 3: BLS 1*. Therefore, participants should spend some time in the facilitated discussion exploring their experiences with resuscitations where environmental issues have made or might make management difficult. The discussion should serve as a primer for the remainder of the module.

Major issues which the facilitator should cover include:

- ARC BLS protocols
- BLS and AED safety in unusual environments (home visits, wet areas, oxygen)
- assessing cervical spine injury risk
- cervical spine precautions in BLS.



## Simulation session

This exercise allows participants to practise their basic life support skills as a team in a more difficult clinical environment. Participants are exposed to a mock cardiac arrest situation and are expected to manage this within in the confines of basic life support skills.

The activities assume two facilitators for every 12 participants. Participants should be divided into two groups of six (Timetable 1). Three participants each participate in one scenario and observe a second. The debriefing period should include all six participants of that group, that is, the active participants and their observers. It is possible to run these scenarios with smaller groups. If only six participants are present, Simulations 1 and 2 can be run sequentially (Timetable 2).

These scenarios can be run on low-fidelity simulators (for example, Resus Anne), but are also quite suitable for more sophisticated simulators (for example, Sim Man).

### Simulation 1: Hospital-in-the-home

#### Scenario design

In this scenario, a 65-year-old man collapses at home just as the hospital-in-the-home (HITH) team arrives. He is in ventricular fibrillation (VF). Participants are required to recognise this, initiate CPR and deploy the AED.

Because hospital medical staff rarely participate in HITH home visits, this scenario is aimed at nursing and allied health staff. However, the simulation includes an option to include a medical presence as a general practitioner performing a home visit, if medical staff are in the participant group.

#### Case history

##### Patient details

<b>Sex</b>	Male
<b>Age</b>	65
<b>Past history</b>	Smoker, hypertension, atrial fibrillation (AF), pacemaker Prescribed warfarin 3 mg per day, irbesartan 150 mg per day
<b>Social history</b>	Married, lives at home
<b>History of present illness</b>	HITH patient being monitored for AF
<b>Presenting symptoms</b>	Collapses at home just before a routine arrival of HITH team

Resources	
General	
Setting/environment	Private residence
Patient attire	Comfortable clothing, shirt, long pants, shoes and socks
Monitoring	None
Supporting documentation required	HITH treatment charts for AF

Equipment		
Equipment	Number	Sourced from
Manikin	1	
Pacemaker 'prop'	1	
Set of clothes	1	
HITH treatment chart	1	
OP airway	1	
Bag-mask device or pocket mask, depending on local HITH practice	1	
Oxygen supply	1	
AED	1	
AED pads	1 set	
Telephone	1	

Roles
<b>Participants 1 and 2: Nursing and/or allied health</b>
You are health professionals on a home visit. As you arrive at the patient's home, his wife suddenly appears at the door distressed. She states that her husband has just collapsed on the floor and is not breathing. You enter the room and find that the patient is unwell. He suffers from AF and has a permanent pacemaker. You need to initiate management. You have some basic resuscitation equipment and an AED in the hospital car. You will need to retrieve these. You should manage the patient according to your capabilities and professional roles in real life—that is, medical, nursing or allied health.
<b>Optional Participant 3: Medical</b>
You are a general practitioner making a home visit to your patient. He suffers from AF and has a permanent pacemaker. He is also under the care of the HITH team from your local hospital and they have arranged to meet you there today. As you arrive at the patient's home, his wife suddenly appears at the door distressed. She states that her husband has just collapsed on the floor and is not breathing. You enter the room and find that the patient is unwell. You need to initiate management. Some basic resuscitation equipment and an AED are in the hospital car. You will need to retrieve these. You should manage the patient according to your capabilities and professional roles in real life—that is, medical, nursing or allied health.

**Faculty role play: Patient's wife**

You are the wife of a man who has just collapsed. The HITH team is managing him for AF. He also has a permanent pacemaker. You meet them at the door and advise them that he has just collapsed and doesn't appear to be breathing. You have limited BLS experience, but remain calm, helpful and follow instructions that the participants give you.

**Faculty role play: Ambulance officer**

To conclude the scenario, you arrive at the patient's house and ask for a handover and prepare to take the patient to hospital.

**Simulator programming considerations**

System	Baseline state	Change in State 1	Change in State 2	Resolution
CVS	Ventricular fibrillation, pulseless	n/a*	n/a	Sinus tachycardia after three defibrillations Return of spontaneous circulation (pulses) (assume return of pulses if low-fidelity manikin)
Respiratory	Apnoeic	n/a	n/a	Return of spontaneous respirations, RR 18 (assume return of spontaneous respiration if low-fidelity manikin)
Neurologic	Unresponsive	n/a	n/a	Return of consciousness GCS = 14 (assume GCS 14 if low-fidelity manikin)
Response to participant intervention	No CPR then remains in baseline state CPR and successful use of AED go to resolution	n/a	n/a	

*\* For participants who perform well, the patient could be returned to VF or VT so that prolonged CPR and multiple attempts at defibrillation are needed.*

Debriefing points:

- issues surrounding obtaining assistance outside the hospital environment
- initiation of CPR
- effective ABC management
- effective use of the AED
- issue of a permanent pacemaker
- equipment/skills needed by home visiting health professionals
- utilising lay people/relatives/bystanders in resuscitation attempts.

### Simulation 2: Injured/wet patient

#### Scenario design

In this scenario, a 62-year-old woman collapses in the bathroom on the rehabilitation ward. She has pulseless VT. Participants are required to recognise this, deal with the environmental hazards and confines, initiate CPR and deploy the AED.

#### Case history

##### Patient details

Sex	Female
Age	62
Past history	Ischaemic heart disease Prescribed GTN 25 mg patch topically, aspirin 150 mg per day
Social history	Married, lives at home
History of present illness	Currently in rehabilitation ward recovering from elective total hip replacement
Presenting symptoms	She activated the distress buzzer in the bathroom before collapsing to the wet bathroom floor, struck her head and sustained an injury to her face

Resources	
General	
Setting/environment	Small hospital bathroom, wet floor, shower running
Patient attire and appearance	Wet hospital gown Evidence of facial injuries, broken dentures, blood around mouth Cramped with head flexed into chest GTN patch applied to chest
Monitoring	None
Supporting documentation required	Bedside medication/observation chart

Equipment		
Equipment	Number	Sourced from
Manikin	1	
GTN patch 'prop'	1	
Hospital gown	1	
Bedside charts	1	
Broken dentures	1	
'Blood' for facial injury	1	
OP airway	1	
Bag-mask device	1	
Oxygen supply	1	
AED	1	
AED pads	1 set	
Towels	2	
Cervical collar	1	

Roles
<b>Participant 1</b>
You are a health professional responding to a distress buzzer in the patient's bathroom on the rehabilitation ward. You find an unwell elderly patient collapsed on the bathroom floor and need to initiate management. You have two colleagues available to assist you if needed. Some basic resuscitation equipment and an AED are located in an adjacent room. You will need to retrieve these. You should manage the patient according to your capabilities and professional roles in real life—that is, medical, nursing or allied health.

### Participants 2 and 3

You are health professionals working on the rehabilitation ward. Your colleague (Participant 1) may ask for assistance with managing a patient. Some basic resuscitation equipment and an AED are located in an adjacent room. You will need to retrieve these. If asked to help, you should manage the patient according to your capabilities and professional roles in real life—that is, medical, nursing or allied health.

### Faculty role play: Cardiac arrest team

You are a senior medical person at the hospital, part of the hospital's cardiac arrest team. At the conclusion of the scenario, you arrive with the crash cart and prepare to take over the care of the patient. You may ask for a handover from the participants. If the participants experience difficulties, it might be appropriate to enter the scenario earlier and offer assistance.

### Simulator programming considerations

System	Baseline state	Change in State 1	Change in State 2	Resolution
CVS	Ventricular tachycardia, pulseless	n/a*	n/a	Sinus tachycardia after three defibrillations Return of spontaneous circulation (pulses) (assume return of pulses if low-fidelity manikin)
Respiratory	Apnoeic	n/a	n/a	Return of spontaneous respirations, RR 18 (assume return of spontaneous respiration if low-fidelity manikin)
Neurologic	Unresponsive	n/a	n/a	Return of consciousness GCS = 14 (assume GCS 14 if low-fidelity manikin)
Response to participant intervention	No CPR then remains in baseline state CPR and successful use of AED go to resolution	n/a	n/a	

\* For participants who perform well, the patient could be returned to VF or VT so that prolonged CPR and multiple attempts at defibrillation are needed.

Debriefing points:

- recognition of need to initiate hospital's 'cardiac response'
- AED safety issues
- cervical spine precautions: determining when to fit C-collar in the collapsed patient
- initiation of CPR
- effective ABC management
- effective use of AED.

### **Summary**

The summary session reinforces content covered in the learning activities, and is an opportunity for participants to reflect on what they have covered. No new material should be introduced.

Points to cover in the summary include:

- assessment of the collapsed person
- DRABC steps of BLS
- coordination of resuscitation efforts
- difficulties in delivering BLS in unusual environments
- safe and appropriate use of AED
- cervical spine precautions in the collapsed patient.

Participants should be encouraged to review the appropriate ARC Guidelines in their own time to reinforce the skills acquired in this module. They should be offered access to equipment and educators in the future if they need to practise or improve their skill level or confidence. Participants might also be encouraged to attend and observe a real-life cardiac arrest in order to put these skills into a clinical context.

## Resource list

The following resource list assumes two facilitators for every 12 participants. As a minimum, the following resources are needed to conduct this module.

Resource	Quantity	Additional comments
Facilitators	2	Allows one facilitator per simulation
ARC BLS flowchart	1	For reference in introduction
ARC Guidelines 4, 5, 6, 7 and 11.5, February 2006	1	For educator's reference as needed
Hospital BLS protocol	1	Only if different from ARC Guidelines
Hospital AED protocol	1	For educator's reference
Manikins	2	Suitable for airway management, and capable of simulating VF/VT and receptive to defibrillation  Manikin used for bathroom scenario needs to be relatively easy to move
Pacemaker 'prop'	1	For scenario 1
GTN patch 'prop'	1	For scenario 2
Oropharyngeal and nasopharyngeal airways	2 sets	One for each manikin
Oxygen supply	2	May be piped or bottled
Bag-mask ventilation devices	2	May be a pocket mask for HITH scenario, depending on local HITH protocols and practice
AED	2	
AED pads	2 sets	
Telephone	1	For HITH scenario
Cervical collar	1	For bathroom scenario
Towels	1	For bathroom scenario
Feedback forms	2	As prompts for each facilitator
Evaluation forms	12	One for each participant
PowerPoint presentation	1	



## Evaluation

A formal evaluation has been specifically developed for this module. It incorporates the objectives of the module and the perceptions of the participants about whether they have increased their understanding by working through the module. It is highly recommended that this formal evaluation be copied and completed by all participants at the completion of the module.

A range of informal evaluation tools may also be used in conjunction with this evaluation throughout the module, including those available in the Department of Human Services' *Clinical Skills Facilitators Manual* from the basic course conducted in 2007.

## References

1. Australian Resuscitation Council Guideline 7: Cardiopulmonary Resuscitation. February 2006
2. American Heart Association 2005 Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Part 2: Adult Basic Life Support. *Circulation* 2005 112: iii\_5–iii\_16
3. Australian Resuscitation Council Guideline 11.7: Equipment and Techniques in Adult Advanced Life Support. February 2006
4. Cummins R. 2002 Danger of Fires in Defibrillation in an Oxygen-Enriched Environment. *Currents in Emergency Cardiovascular Care* (American Heart Association) 13: 11–12
5. McNulty G. and Robertshaw H. 1999 Risk of Fire Outweighed by Need for Oxygen and Defibrillation. *J Accid Emerg Med* 16: 77
6. Australian Resuscitation Guideline 11.5: Electrical therapy for Advanced Life Support. February 2006
7. Panacek E., Munber M., Rutherford W. and Gardner S. 1992 Report of Nitropatch Explosions Complicating Defibrillation. *Am J Emerg Med* 10: 128–129
8. Gould-Bartose, A. 2006 Defibrillation on a Wet or Metal Surface. *Zoll Medical Technical Report*
9. Allen M. 2006 Pacemakers and Implantable Cardioverter Defibrillators. *Anaesthesia* 61: 883–890
10. American Heart Association 2005 Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Part 14: First Aid. *Circulation* 2005 112: 196–203
11. American Heart Association 2005 Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Part 10.7: Cardiac Arrest Associated with Trauma. *Circulation* 2005 112: 146–149
12. American Heart Association 2005 Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Part 10.3: Drowning. *Circulation* 2005 112: 133–135
13. Hallstrom A., Cobb L., Johnson E. and Copass M. 2000 Cardiopulmonary Resuscitation by Chest Compression Alone or with Mouth-to-Mouth Ventilation. *N Eng J Med* 342: 1546–1553



## Module 4: BLS 2—evaluation

Thank you for participating in this module. As part of our commitment to quality improvement the following questionnaire will be used to plan future implementation of this module. We appreciate your time completing this evaluation.

### 1. Overall

How would you rate this module?

poor     fair     good     very good     outstanding

### 2. Learning objectives

Please consider whether this module was successful in meeting the following learning objectives:

<i>BLS adult</i> Learning objectives of Module 4: BLS 2	Strongly disagree	Disagree	Slightly agree	Agree	Strongly agree
Reviewed the Australian Resuscitation Council (ARC) BLS Guidelines <sup>1</sup> for cardiac arrest in adults	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demonstrated their ability to assess a simulated patient (manikin) mimicking a collapsed person and determine the need for BLS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Applied BLS skills according to the ARC principles of DRABC in a simulated environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Performed team-based cardiopulmonary resuscitation (CPR) in a difficult clinical setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demonstrated the use of an AED in a difficult clinical setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### 3. Important learning outcomes

What are the three most important things you have learned from this module?

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#### 4. Module implementation

Please indicate to what extent you agree or disagree with each of the following statements in relation to the implementation of the module.

	Strongly disagree	Disagree	Slightly agree	Agree	Strongly agree
The facilitator respected my experience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The facilitator encouraged my participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I was able to ask the facilitator questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The facilitator was able to answer my questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The feedback I received was clear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The feedback I received will assist me in my future performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There was adequate time for the skills stations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There was adequate time for the facilitated discussions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There was adequate time for the simulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have increased my confidence in performing BLS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have identified future learning needs in this topic area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### 5. Future module implementation

Do you think the module should be altered in any way?  yes  no

If yes, what recommendations do you have?

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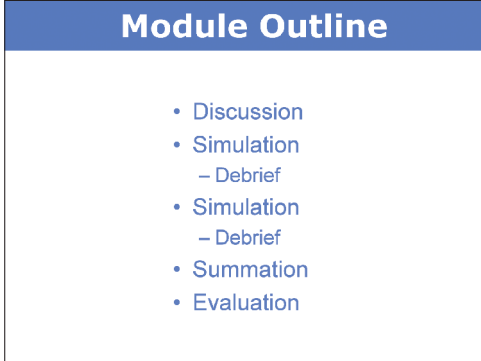
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**Thank you**

## PowerPoint presentation

1. A PowerPoint slide with a blue header containing the text "Clinical Skills in Hospitals Project". The main content is centered and reads "Basic Life Support (BLS) ADULT MODULE 4 'BLS 2'". At the bottom left is the StV logo, and at the bottom right is the text "A Victorian Government initiative" next to the Victorian state logo.
2. A PowerPoint slide with a blue header containing the text "Module Outline". The main content is a bulleted list: "• Discussion", "• Simulation – Debrief", "• Simulation – Debrief", "• Summation", and "• Evaluation".



# Module 5: Complex BLS

## Introduction

*BLS adult* (basic life support) was developed as a teaching and learning tool for Victorian clinical educators. The information contained in each module was developed using evidence-based resources and examples of best practice. Where expert opinion varies, a discussion section is included. However, it is not within the scope of ALS paediatric to address the full spectrum of local variations. Variations can occur in several areas, including practices relating to types of equipment used, infection control processes, practice guidelines and so on. Therefore, educators should, where appropriate, adapt content to reflect their local policies, procedures and protocols. This will ensure the relevancy of the package content to your learners.

The modules are designed to be discrete courses in their own right. They are timetabled so they can be completed in a 1–2 hour timeframe. This timeframe was chosen after we received feedback from clinical educators requesting shorter courses, because health professionals often have limited time to educate away from patients. However, the packages may also be combined into a one- or two-day course, as described in the Module outline.

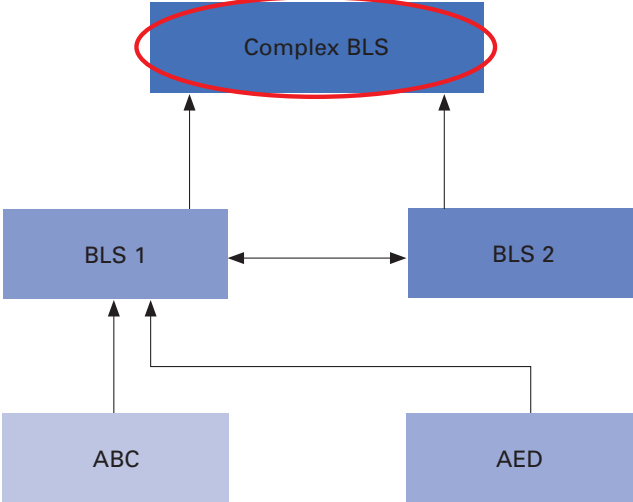
*BLS adult* should be used as an educational tool to assist in the teaching of clinical skills. It is structured as a guide to assist clinical educators, and uses many concepts taught in the *Clinical Skills in Hospitals Project* (Train-the-Trainer courses). Educators are encouraged to build on this resource by adding their own scenarios which incorporate hospital/health service protocols, policies and other resources. Each module is designed as a lesson plan to incorporate the simulations into the teaching of clinical skills.

## Aims

*BLS adult* aims to make participants confident in their application of basic life support (BLS) knowledge and skills on adults in different environments and settings.

## Package structure

*BLS adult* contains five modules which provide learning opportunities for health professionals at all levels of experience from medical and nursing disciplines. Modules 1 and 2 are regarded as fundamental. Modules 3 and 4 are more difficult, and are regarded as intermediate. Module 5 is more advanced and regarded as complex.

Level of complexity	Package structure
<p><b>Complex</b> For participants with more than 4 years experience or who have completed Modules 1–4</p>	 <pre> graph BT     ABC[ABC] --&gt; BLS1[BLS 1]     AED[AED] --&gt; BLS1     BLS1 &lt;--&gt; BLS2[BLS 2]     BLS1 --&gt; ComplexBLS[Complex BLS]     BLS2 --&gt; ComplexBLS     style ComplexBLS stroke:#f00,stroke-width:2px           </pre>
<p><b>Intermediate</b> For participants in postgraduate years 3–4 or who have completed Modules 1 and 2</p>	
<p><b>Fundamental</b> For participants in postgraduate years 1–2</p>	

BLS (basic life support) includes basic airway management skills, rescue breathing techniques, external cardiac compressions and use of the automatic external defibrillator.

*BLS adult* was designed to develop participants' knowledge, skills and behaviours in BLS and to expose them to increasingly complex scenarios aimed at testing their ability to combine these individual skills, work as a team and problem solve in more difficult situations.

Educators delivering these modules should be aware of participants' level of experience and choose appropriate modules. Modules presume an increasing level of knowledge as they progress, ranging from a fundamental knowledge of anatomy and physiology for the fundamental modules, up to detailed knowledge of ALS and resuscitation for the complex modules. Novice participants (such as first-year graduates) are expected to start with the fundamental modules, and only move onto intermediate and more complex modules as they demonstrate proficiency. More experienced participants may start at the intermediate level if the educator is satisfied that they have the prior knowledge and skills. Individual educators are responsible for assessing each participants' baseline knowledge and determining which modules they need to complete. More specific descriptions of presumed knowledge are outlined in each module.



The design of these packages presumes that the clinical educators using them have knowledge and expertise in current best practice regarding the teaching of clinical skills and conducting facilitated discussions. Knowledge and expertise are presumed commensurate with the Department of Human Services' basic and advanced Train-the-Trainer programs. Clinical educators are encouraged to refer to Department of Human Services' *Clinical Skills Facilitators Manual* for theory on:

1. Peyton's model for teaching clinical skills
2. leading small group discussions
3. giving feedback
4. crisis resource management skills.



# Module 5: Complex BLS

Authors: Dr Stuart Dilley, Ms Debbie Paltridge

## Aims

The purpose of *BLS adult—Module 5: Complex BLS* is for participants to use their clinical, management and personal skills in dealing with a complex basic life support (BLS) scenario.

## Presumed knowledge

This module is targeted to health professionals with significant experience with BLS. However, they are expected to have completed *BLS adult—Module 3: BLS 1* and *Module 4: BLS 2*, and have a high level of knowledge and skills relevant to:

1. BLS protocols
2. basic airway management
3. rescue breathing techniques
4. external cardiac compressions
5. use of the automatic external defibrillator (AED)
6. managing critical patients.

Participants who do not feel totally comfortable with these clinical skills should be redirected to *BLS adult—Module 3: BLS 1* and *Module 4: BLS 2*.

## Objectives

By the end of this module, participants should have:

1. reviewed the Australian Resuscitation Council (ARC) BLS Guidelines<sup>1</sup> for cardiac arrest in adults
2. practised adult BLS as a team member in a difficult clinical setting
3. reflected on their ability to problem solve under stress
4. reflected on their ability to communicate effectively on an interpersonal level in a stressful situation
5. recognised factors that influence team performance.

## Background information for educators

Much of the background information pertaining to airway, breathing and chest compressions and AED use is covered in *BLS adult—Module 1: ABC* and *Module 2: AED*. Participants should have practised these skills and worked as teams in *BLS adult—Module 3: BLS 1* and *Module 4: BLS 2*.

This module allows participants to use these skills in a more complex scenario where the issues are not necessarily clinical. Clinical knowledge is assumed. As evident from the learning activities, most of the discussion will revolve around opinions and experiences, rather than hard clinical facts.

Managing critical patients is a stressful challenge. Success relies on clinical knowledge and skills, but also on effective individual performance, teamwork and health care systems. Health professionals may need to deal with deficiencies in each of these aspects, while simultaneously confronting distressing emotional responses in staff and relatives.

Crisis resource management<sup>3</sup> (CRM) describes a set of strategies or skills developed to help individuals and teams to perform efficiently in these high risk/high stress situations. Common CRM principles include:

- know your environment (workplace, equipment, staff and policies)
- anticipate and plan (proactive contingency planning, expect the unexpected)
- call for help early
- exercise leadership
- communicate clearly
- use all available information
- allocate attention wisely (determine focus, avoid fixation, prioritise)
- distribute workload evenly.

Clinical educators are referred to Chapter 2 in the *Clinical Skills Facilitator's Advanced Course Manual* for more detailed information and references.

The performance of individuals—either on their own or as part of a team—has important implications for managing critical events. Individuals should be aware of factors that might influence personal performance in themselves or their colleagues, such as:

- experience and knowledge levels
- situational stress (some stress is good, too much may be harmful)
- fatigue and tiredness
- difficult environments (noise, distractions, unfamiliarity, workload, staff, resources)
- negative life events (illness, family crises)
- attitude and personality (anti-authority, impulsive, invulnerable, macho)
- drug and alcohol use.

Some of these issues might need to be directly addressed (adequate sleep, drug and alcohol counselling, education); in others, recognition and support may be adequate (for example, family crises). Similarly, effective and efficient teamwork and leadership are crucial when dealing with critical clinical situations. Effective teams are characterised by<sup>3, 4</sup>:

- organisation
- leadership
- familiarity of members
- designated roles
- effective communication
- situational awareness (the 'big picture')
- avenues for conflict resolution.

Effective team leaders are characterised by:

- clear communication of plans and goals
- allocation of tasks
- remaining free to oversee management
- being receptive to input from team members
- situational awareness, maintaining team focus
- prioritisation and problem solving
- promoting a positive group culture.

Effective communication is characterised by:

- directed assertive communication in simple language (using eye contact and people's names)
- calm, polite, controlled tone and voice
- passage of information through leader as central relay
- verification of task completion and referral back to leader ('closing the loop')
- team awareness of situation.

Despite the best efforts of health professionals, many people will die because of their cardiac arrest, particularly if this occurs outside the hospital setting<sup>5, 6</sup>. Apart from in exceptional circumstances (for example, hypothermia), prolonged resuscitation efforts beyond 30 minutes are usually futile. Similarly, if a patient is in asystole for more than 10 minutes, it is reasonable to stop resuscitation<sup>7</sup>. Conversations to this effect with a patient's relatives are difficult and emotionally charged. While not unanimous, the literature generally supports relatives being present during resuscitation<sup>8, 9</sup>.

This difficult task may be made a little easier by:

- choosing an appropriate private setting
- establishing trust
- asking the relatives what they understand
- responding to emotions
- offering support
- ‘hope for the best, but prepare for the worst’.

## Learning activities

Suggested learning activities and timetables are outlined below. Timetable 1 is designed for 12 participants working in two groups of six. Timetable 2 is designed for six participants working together.

Timetable 1			
Timing	Activity		Objective
40 minutes	Facilitated discussion		1
	Group 1	Group 2	
15 minutes	Simulation 1	Simulation 2	2, 3, 4 and 5
30 minutes	Debrief	Debrief	2, 3, 4 and 5
15 minutes	Simulation 2	Simulation 1	2, 3, 4 and 5
30 minutes	Debrief	Debrief	2, 3, 4 and 5
10 minutes	Summary		2, 3, 4 and 5
10 minutes	Evaluation		

**Total time = 2 hours 30 minutes**

Timetable 2		
Timing	Activity	Objective
40 minutes	Facilitated discussion	1
15 minutes	Simulation 1	2, 3, 4 and 5
30 minutes	Debrief	2, 3, 4 and 5
15 minutes	Simulation 2	2, 3, 4 and 5
30 minutes	Debrief	2, 3, 4 and 5
10 minutes	Summary	2, 3, 4 and 5
10 minutes	Evaluation	

**Total time = 2 hours 30 minutes**

## Facilitated discussion

The facilitator should introduce the simulation training to follow and lead a discussion amongst participants around the individual performance, teamwork and CRM. There should be little need to cover the clinical aspects of BLS.

While the clinical conditions in the scenarios are straightforward, non-clinical issues make the scenarios more complex and difficult for the participants. Therefore, participants should spend some time in the facilitated discussion exploring their experiences with resuscitations where human factors and communications have affected their ability to function clinically.

Major issues which the facilitator should cover include:

- teamwork principles
- barriers to individual performance
- effective leadership
- effective teams
- effective team communication
- effective communication with relatives.

PowerPoint slides are available for the facilitator to use to summarise these main points at the end of the discussion, or as triggers if participants have not identified the major issues. However, facilitators should avoid delivering a didactic lecture.

## Simulation session

This exercise allows participants to practise their BLS skills as a team in a clinical environment complicated by equipment failure and human factor issues. Participants are exposed to a mock cardiac arrest situation and are expected to manage the clinical aspects within the confines of BLS skills.

The program assumes two facilitators for every 12 participants. Participants should be divided into two groups of six (Table 1). Three participants each participate in one scenario and observe a second. The debriefing period should include all six participants of that group, that is, the active participants and their observers.

As a more complex scenario, it may be difficult to enrol 12 participants. However, it is possible to run these scenarios with smaller groups. If only six participants are present, Simulations 1 and 2 can be run sequentially (Table 2).

These scenarios can be run on low-fidelity simulators (for example, Resus Anne), but are also quite suitable for more sophisticated simulators (for example, Sim Man).

## Simulation 1: Equipment failure/distraught junior colleague

### Scenario design

In this scenario, a 45-year-old man collapses on the surgical ward, having earlier complained about chest pains. He is in VF arrest. Participants are required to recognise this, initiate CPR and deploy the AED. An equipment malfunction occurs with the bag-mask device. The valve comes apart and requires reassembly by the participants in order to enable rescue breathing. A junior nurse is distraught because the patient had told her about the chest pain an hour ago.

### Case history

#### Patient details

Sex	Male
Age	45
Past history	Smoker
Social history	Married, lives at home
History of present illness	Orthopaedic patient three days post-knee reconstruction Prescribed morphine 10 mg IM PRN, Panadeine Forte PRN, clexane 80 mg SC BD
Presenting symptoms	Complains of chest pain and collapses as health professionals enter the room for a routine ward round

### Resources

#### General

Setting/environment	Hospital surgical ward
Patient attire and appearance	Hospital gown
Monitoring	None
Supporting documentation required	Bedside medication/observation chart



Equipment	Number	Sourced from
Manikin	1	
Hospital gown	1	
Bedside charts	1	
OP airway	1	
Bag-mask device	1	Valve on bag-mask device is not assembled properly and comes apart Participants need to reassemble to enable rescue breathing
Oxygen supply	1	
AED	1	
AED pads	1 set	
Zimmer knee splint	1	

## Roles

### Participants 1, 2 and 3

You are three health professionals on a ward round on the surgical ward. You come across a patient who needs assistance. An AED and basic airway equipment are in an adjacent room, which you need to retrieve. Some issues may arise that are not necessarily clinical problems.

### Faculty role play: Junior nurse

You are a hard-working junior nurse working on the ward, responsible for this patient. The patient had complained of chest pains to you an hour earlier. You were concerned, but were distracted from reporting this due to work demands and patient workload. You are helpful and competent in the resuscitation. However, you are distraught and close to tears as the man has now arrested. You say things like 'This wouldn't have happened if I had done something earlier', 'I'm sorry, it's all my fault', 'I had too much work to do'.

### Faculty role play: Cardiac arrest team

You are a senior medical person at the hospital, part of the hospital's cardiac arrest team. At the conclusion of the scenario, you arrive with the crash cart and prepare to take over the care of the patient. You may ask for a handover from the participants. If the participants experience difficulties, it might be appropriate to enter the scenario earlier and offer assistance.

Simulator programming considerations				
System	Baseline state	Change in State 1	Change in State 2	Resolution
CVS	Ventricular fibrillation, pulseless	n/a*	n/a	Sinus tachycardia after three defibrillations Return of spontaneous circulation (pulses) (assume return of pulses if low-fidelity manikin)
Respiratory Valve on bag-mask device is not assembled properly and comes apart Participants need to reassemble to enable rescue breathing	Apnoeic	n/a	n/a	Return of spontaneous respirations, RR 18 (assume return of spontaneous respiration if low-fidelity manikin)
Neurologic	Unresponsive	n/a	n/a	Return of consciousness GCS = 14 (assume GCS 14 if low-fidelity manikin)
Response to participant intervention	No CPR then remains in baseline state CPR and successful use of AED go to resolution	n/a	n/a	

\* For participants who perform well, the patient could be returned to VF or VT so that prolonged CPR and multiple attempts at defibrillation are needed. However, time should be allocated in the scenario for the participants to address issues raised by the junior nurse (faculty) equipment malfunction.

Debriefing points:

- equipment failure
- unfamiliarity with equipment
- effective leadership and teamwork
- team communication
- managing/helping distressed colleagues.

### Simulation 2: The angry relative

#### Scenario design

In this scenario, a 60-year-old man is waiting with his wife on the rehabilitation ward for his discharge medications. He suddenly becomes unresponsive. His wife calls for help. He is in VF arrest. Participants are required to recognise this, initiate CPR and deploy the AED. The patient's wife is in attendance, and is upset and angry.

#### Case history

##### Patient details

Sex	Male
Age	60
Past history	Smoker, hypertension
Social history	Married, lives at home
History of present illness	Rehabilitation ward admission two weeks ago after medical admission for mild stroke Prescribed aspirin 150 mg per day, irbesartan 150 mg daily, atorvastatin 20 mg per day
Presenting symptoms	Collapses unexpectedly while waiting for discharge medications

#### Resources

##### General

Setting/environment	Hospital rehabilitation ward
Patient attire and appearance	Street clothes, ready for discharge
Monitoring	None
Supporting documentation required	Bedside medication/observation chart

Equipment	Number	Sourced from
Manikin	1	
Shirt, pants, shoes, socks	1	
Bedside charts	1	
OP airway	1	
Bag-mask device	1	
Oxygen supply	1	
AED	1	
AED pads	1 set	

## Roles

### Participants 1, 2 and 3

You are three health professionals on a ward round on the rehabilitation ward. One of your patients recently had a mild stroke, is about to be discharged home and is waiting on discharge medications. Some difficulties are likely to arise, but you should be familiar with the clinical aspects of the case. If you need them, an AED and basic airway equipment are located in an adjacent room, which you will need to retrieve.

### Faculty role play: Angry wife

You are waiting with your husband, who recently had a mild stroke, for his discharge medications. He suddenly collapses and you call for help. You are upset and angry. You told the hospital that he was still sick and should not go home today. Your interactions with the resuscitation team vary from showing concern for your husband ('Will he be okay?', 'Please help him—do everything!', 'What's happening now?') to expressing your anger ('I told them he was still sick!', 'I'll sue the hospital for this!', 'Why did they discharge him?')

### Faculty role play: Cardiac arrest team

You are a senior medical person at the hospital, part of the hospital's cardiac arrest team. At the conclusion of the scenario, you arrive with the crash cart and prepare to take over the care of the patient. You may ask for a handover from the participants. If the participants experience difficulties, it might be appropriate to enter the scenario earlier and offer assistance.

Simulator programming considerations				
System	Baseline state	Change in State 1	Change in State 2	Resolution
CVS	Ventricular fibrillation, pulseless	n/a*	n/a	Sinus tachycardia after three defibrillations  Return of spontaneous circulation (pulses) (assume return of pulses if low-fidelity manikin)
Respiratory	Apnoeic	n/a	n/a	Return of spontaneous respirations, RR 18 (assume return of spontaneous respiration if low-fidelity manikin)
Neurologic	Unresponsive	n/a	n/a	Return of consciousness  GCS = 14 (assume GCS 14 if low-fidelity manikin)
Response to participant intervention	No CPR then remains in baseline state  CPR and successful use of AED go to resolution	n/a	n/a	

\* For participants who perform well, the patient could be returned to VF or VT so that prolonged CPR and multiple attempts at defibrillation are needed. However, time should be allocated in the scenario for the participants to address issues raised by the wife (faculty).

Debriefing points:

- individual and team performance/communication
- relative's presence at resuscitation
- communication of critical clinical issues to relatives
- prognosis post-arrest
- dealing with relative's anger
- hospital risk management issues.

## Summary

The summary session reinforces content covered in the learning activities, and is an opportunity for participants to reflect on what they have covered. No new material should be introduced.

Major points to recap in the summary include:

- teamwork principles
- individual and team performance issues
- effective communication
- communication with relatives
- supporting distressed colleagues.

Participants should be encouraged to explore the literature relevant to CRM, teamwork and performance issues. They may be interested in attending further training in CRM through other complex modules or packages included in this project, or courses run by providers outside of their parent institution.

## Resource list

The following resource list assumes two facilitators for every 12 participants. As a minimum, the following resources are needed to conduct this module.

Resource	Quantity	Additional comments
Facilitator	2	Based on 12 participants
ARC BLS flowchart	1	For reference in introduction
Hospital BLS protocol	1	If different from ARC Guidelines
Hospital AED protocol	1	For educator's reference
PowerPoint presentation	1	Provided with module
Manikin	2	Suitable for airway management, capable of simulating VF/VT and receptive to defibrillation
OP airways	2 sets	One for each manikin
Oxygen supply	2	May be piped or bottled
Bag-mask ventilation devices	2	
AED	2	
AED pads	2 sets	
Feedback forms	2	As prompt for each facilitator
Evaluation forms	12	One for each participant
Zimmer knee splint	1	For Simulation 1

## Evaluation

A formal evaluation has been specifically developed for this module. It incorporates the objectives of the module and the perceptions of the participants about whether they have increased their understanding by working through the module. It is highly recommended that this formal evaluation be copied and completed by all participants at the completion of the module.

A range of informal evaluation tools may also be used in conjunction with this evaluation throughout the module, including those available in the Department of Human Services' *Clinical Skills Facilitators Manual* from the basic course conducted in 2007.

## References

1. Australian Resuscitation Council Guideline 7: Cardiopulmonary Resuscitation. February 2006
2. Murray W. and Foster P. 2000 Crisis Resource Management Among Strangers: Principles of Organising a Multidisciplinary Group for Crisis Resource Management. *J Clin Anesth* 12: 633–638
3. Sundar E., Sundar S. and Pawlowski J. 2007 Crew Resource Management and Team Training. *Anesthesiology Clin* 25: 283–300
4. Meyer A., Bernard S., Smith K., McNeil J. and Cameron P. 2001 Asystolic Cardiac Arrest in Melbourne, Australia. *Emerg Med Austral* 13: 186–189
5. Jennings P., and Pasco J. 2001 Survival from Out-of-Hospital Cardiac Arrest in the Geelong Region of Victoria, Australia. *Emerg Med Austral* 13: 319–325
6. Eisenberg M. and Mengert T. 2001 Primary Care: Cardiac Resuscitation. *N Eng J Med* 344: 1304–1313
7. Holzhauser K., Finucane J. and De Vries S. 2006 Family Presence During Resuscitation: a Randomised Controlled Trial of the Impact of Family Presence. *Aust Emerg Nurs J* 8: 139–147
8. Halm M. 2005 Family Presence During Resuscitation: a Critical Review of the Literature. *Am J Crit Care* 14: 494–512





## Module 5: Complex BLS—evaluation

Thank you for participating in this module. As part of our commitment to quality improvement the following questionnaire will be used to plan future implementation of this module. We appreciate your time completing this evaluation.

### 1. Overall

How would you rate this module?

poor     fair     good     very good     outstanding

### 2. Learning objectives

Please consider whether this module was successful in meeting the following learning objectives:

<i>BLS adult</i> Learning objectives of Module 5: Complex BLS	Strongly disagree	Disagree	Slightly agree	Agree	Strongly agree
Reviewed the Australian Resuscitation Council (ARC) BLS Guidelines <sup>1</sup> for cardiac arrest in adults	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practised adult BLS as a team member in a difficult clinical setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reflected on their ability to problem solve under stress	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reflected on their ability to communicate effectively on an interpersonal level in a stressful situation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recognised factors that influence team performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### 3. Important learning outcomes

What are the three most important things you have learned from this module?

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#### 4. Module implementation

Please indicate to what extent you agree or disagree with each of the following statements in relation to the implementation of the module.

	Strongly disagree	Disagree	Slightly agree	Agree	Strongly agree
The facilitator respected my experience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The facilitator encouraged my participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I was able to ask the facilitator questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The facilitator was able to answer my questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The feedback I received was clear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The feedback I received will assist me in my future performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There was adequate time for the skills stations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There was adequate time for the facilitated discussions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There was adequate time for the simulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have increased my confidence in performing BLS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have identified future learning needs in this topic area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### 5. Future module implementation

Do you think the module should be altered in any way?  yes  no

If yes, what recommendations do you have?

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**Thank you**

## PowerPoint presentation

1. 

Clinical Skills in Hospitals Project

**Basic Life Support (BLS) ADULT MODULE 5 'Complex BLS'**

StV

A Victorian Government Initiative
2. 

**Module Outline**

  - Discussion
  - Simulation
    - Debrief
  - Simulation
    - Debrief
  - Summation
  - Evaluation
3. 

**Crisis Resource Management**

  - Know your environment
  - Anticipate and plan
  - Call for help early
  - Exercise leadership
  - Communicate clearly
  - Use all available information
  - Allocate attention wisely
  - Distribute workload evenly
4. 

**Individual Performance**

  - Experience and knowledge
  - Situational stress
  - Fatigue, tiredness
  - Environment
  - Negative life events
  - Attitude and personality
  - Drug, alcohol use
5. 

**Effective Teams**

  - Organisation
  - Leadership
  - Familiarity
  - Designated roles
  - Effective communication
  - Situational awareness
  - Conflict resolution
6. 

**Effective Leaders**

  - Clear communication
  - Allocation of tasks
  - Overseeing management
  - Receptive to team input
  - Situational awareness
  - Prioritisation
  - Positive group culture
7. 

**Effective Communication**

  - Directed and assertive
  - Calm, polite, controlled
  - Central relay via leader
  - Verification of completed task
  - Team awareness



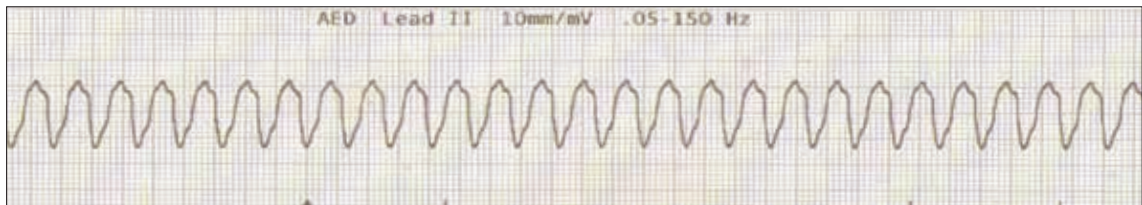
# Appendix 1: Cardiac rhythm three lead ECG rhythm strips

## Ventricular tachycardia

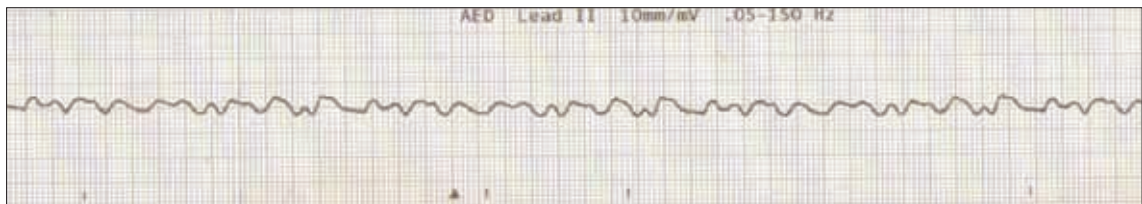
### Slow VT



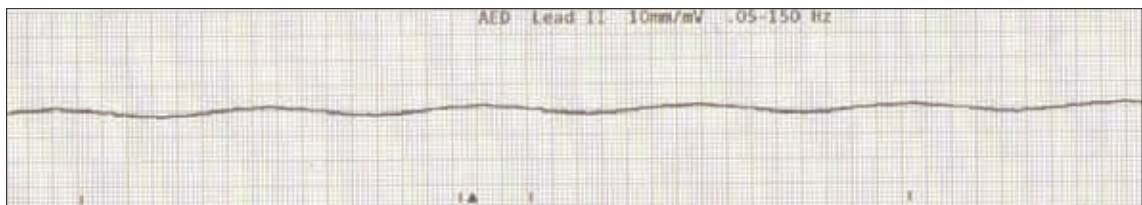
### Rapid VT



## Ventricular fibrillation



## Asystole





# Acronyms, abbreviations and measurements

## Acronyms

A/C	assist control
AAFB	acid and alcohol fast bacilli
ABG	arterial blood gas
ACS	acute coronary syndromes
AEDs	automated external defibrillator(s)
AF	atrial fibrillation
AHA	American Heart Association
ALS	advanced life support
AMI	acute myocardial infarction
APO	acute pulmonary oedema
APTT	activated partial thromboplastin time
ARC	Australian Resuscitation Council
ASB	assisted spontaneous breathing
AV node	atrioventricular node
BBB	bundle branch block
BiPAP	bilevel positive airway pressure
BLS	basic life support
BUN	blood urea nitrogen
CABG	coronary artery bypass graft
cath lab	catheterisation laboratory
CE	cardiac enzymes
CHB	complete heart block
CK	creatine kinase
CKMB	creatine kinase Mb
CMV	controlled mandatory ventilation
CNS	central nervous system
COAD	chronic obstructive airways disease
COPD	chronic obstructive pulmonary disease
CPAP	continuous positive airway pressure
CPR	cardiopulmonary resuscitation
CRM	crisis resource management
CVA	cerebrovascular accident
CVC	central venous catheter
CVS	cardiovascular system
CXR	chest X-ray
DIC	disseminated intravascular coagulation
DKA	diabetic ketoacidosis
DKS	Damus-Kaye-Stansel [procedure]

DRABC	D: danger R: response A: airway B: breathing C: circulation
DVT	deep vein thrombosis
ECF	extracellular fluid
ECG	electrocardiogram
ED	emergency department
EMD	electromechanical dissociation
ENT	ear, nose and throat
EPAP	expiratory positive airways pressure
ET	endotracheal
FBE	full blood examination
FFP	fresh frozen plasma
FRC	functional residual capacity
g	gram
GCS	Glasgow Coma Scale
GI	gastro-intestinal
GIT	gastro-intestinal tract
GTN	glyceryl trinitrate
Hb	haemoglobin
HIV	human immunodeficiency virus
HME	heat moisture exchanger
HPS METI	a brand (Human Patient Simulator) of fully automatic, high-fidelity patient simulator
HR	heart rate
I:E ratio	inspiration-to-expiration ratio
ICF	intracellular fluid
ICP	intracranial pressure
INR	international normalised ratio
IO	intraosseous
IPAP	inspiratory positive airways pressure
IPPV	intermittent positive pressure ventilation
IV	intravenous
LBBS	left bundle branch block
LDH	lactate dehydrogenase
LMA	laryngeal mask airway
mA	milliampere
MET	medical emergency team
NBM	nil by mouth



NGT	nasogastric tube
NIMC	national inpatient medication chart
NIPPV	non-invasive positive pressure ventilation
NIV	non-invasive ventilation
NP airways	nasal prong airways
NSEACS	non-ST elevation acute coronary syndrome
NSR	normal sinus rhythm
OP	oropharyngeal airway
OTC	over-the-counter medications
PCA	patient-controlled analgesia
PCI	percutaneous coronary intervention
PEA	pulseless electrical activity
PEEP	positive end expiratory pressure
pH	the measure of the acidity or alkalinity of a solution
PICC	peripherally inserted central catheter
PIP	peak inspiratory pressure
PRVC	pressure regulated volume control
PS	pressure support
PTX	pneumothorax
QRS	wave form seen on electrocardiogram
RA	room air
RBBB	right bundle branch block
RIC line	rapid infusion catheter exchange set
RMO	registered medical officer
rPA	retaplast
RR	respiration rate
RSI	rapid sequence induction
rt-PA	alteplase
RV	right ventricular
SIMV	synchronised intermittent mandatory ventilation
SK	streptokinase
SR	Sinus rhythm
STEMI	ST elevation myocardial infarction
SVC	superior vena cava
TPN	total parenteral nutrition
UWSD	underwater seal drainage
V/Q mismatch	ventilation/perfusion mismatch
VF	ventricular fibrillation
VT	ventricular tachycardia
WCC	white cell count
WOB	work of breathing
WPW	Wolf-Parkinson-White syndrome

## Chemical formulae

CaCl <sub>2</sub>	calcium chloride
CO <sub>2</sub>	carbon dioxide
ETCO <sub>2</sub>	end-tidal carbon dioxide
FiO <sub>2</sub>	fraction of inspired oxygen
H <sub>2</sub> CO <sub>3</sub>	bicarbonate
MgCl <sub>2</sub>	magnesium chloride
MgSO <sub>4</sub>	magnesium sulphate
PaCO <sub>2</sub>	partial pressure of carbon dioxide in arterial blood
PaO <sub>2</sub>	partial pressure of oxygen in arterial blood
SpO <sub>2</sub>	percentage of oxygen saturation in blood
SaO <sub>2</sub>	saturation of oxygen in arterial blood flow

## Units of Measurement

abbreviation	unit
mmHg	millimetres of mercury
L	litre
mL	millilitre
µg	microgram — one-millionth (10 <sup>-6</sup> ) of a gram
mmol	millimole
J	joule
mg	milligram
cm	centimetre
m	metre

