

APLS 7e Recertification SKILLS station: defibrillation

Skill to be practised and assessed during the skill station:

- safe defibrillation with manual defibrillator

Also to be discussed during the skill station:

- cardioversion/synchronised shocks (discuss and demonstrate)
- AED use (discuss)

Candidates should be informed that manual defibrillation will be assessed during the session.

This skill will also be continuously assessed in the simulations on an ongoing basis.

During the skill station, the faculty should demonstrate defibrillation ‘in real time’ (old Stage 1) and discuss local equipment and safety before offering candidates the opportunity to practise the skill with support and coaching as necessary to enable the faculty to assess the candidates (old Stage 4). Where candidates need support, they can only be assessed as ‘safe/meets’ once they are independently able to perform the skill.

The following is for background information about each of the skills and to give you context if questions are asked.

Remember however that you are coaching not teaching these skills.

The candidates have already had the opportunity to watch skills videos, and you will give them the opportunity to practise and be coached to improve their practice.

Key assessment points for defibrillation are listed in the tables given below.

DEFIBRILLATION – key principles for all defibrillators

Safety

A defibrillator delivers enough current to *cause* cardiac arrest. The user must ensure that other rescuers are not in physical contact with the child (or the patient bed/trolley) at the moment the shock is delivered. When using paddles, the defibrillator should only be charged when the paddles are either in contact with the child (or replaced properly in their storage positions for testing the device).

A high ambient oxygen concentration may lead to fire through “arcing”. Any free-flowing oxygen (i.e. through a bag mask system) should be removed to a distance of >1m or turned off.

Many defibrillators are available. Providers of advanced paediatric life support should make sure that they are familiar with those they may have to use.

DEFIBRILLATION – AED

Automated external defibrillators (AEDs) are now commonplace.

- The standard adult shock is delivered in children over 8 years.
- For children under 8 years, attenuated paediatric pads or the child 'setting/button' should be used with the AED.
- For an infant of less than 1 year, a manual defibrillator which can be adjusted to give the correct shock is recommended. However, if an AED is the only defibrillator available, its use should be considered, preferably with paediatric attenuation pads.

The order of preference for defibrillation in the under 1-year- olds is as follows:

1. Manual defibrillator.
2. AED with dose attenuator/child setting.
3. AED without dose attenuator.

All or most AEDs can detect ventricular fibrillation/ventricular tachycardia (VF/VT) in children of all ages and differentiate 'shockable' from 'non-shockable' rhythms with a high degree of sensitivity and specificity.

DEFIBRILLATION – HANDS FREE assessment table

	Defibrillation – hands free	Notes	Performed Y/N)
	Basic life support should be interrupted for the shortest possible time (steps 8-11)		
1	Apply adhesive monitoring electrodes to the correct positions	Chest compressions continue	
2	Turn on the defibrillator		
3	Briefly interrupt compressions to assess the rhythm. If VF/pulseless VT : Move to step 4 to prepare to deliver a shock. If PEA/Asystole then jump to 11	Pause compressions	
4	Select the correct energy level required whilst compressions continue	Restart chest compressions	
5	Shout 'CHARGING, oxygen away, continue compressions'	Chest compressions continue Ensure oxygen removed	
6	Press the charge button	Chest compressions continue	
7	Wait until the defibrillator is charged	Chest compressions continue Ensure hand away from buttons	
8	Shout "Stop compressions, everybody stand clear, (visual glance of monitor to check still shockable) SHOCKING". (If PEA/Asystole do not shock, but disarm/dump the charge and jump to 11)	Everyone stands back	
9	Check all personnel are clear and that the oxygen has been removed	Everyone stands back	
10	Deliver the shock <i>whilst observing the patient</i>	Everyone stands back	
11	Recommence CPR	CPR resumes	

In order to achieve the optimum outcome, defibrillation must be performed quickly and efficiently. This requires correct electrode pad selection, correct electrode pad placement, good electrode pad contact and correct energy selection.

Correct electrode selection

Defibrillators for paediatric use should be supplied with two sets of electrode pads. Adult electrode pads can be used for children aged 8 years and above and paediatric electrode pads for the younger child. Children vary in size so there is some discretion.

Correct electrode placement

Electrode pads are usually labelled pictorially to show placement positions. Pads have become the method of choice, because once placed they save time, resulting in less interruption to chest compressions and time to defibrillation, and they are also safer. They promote charging during compressions which decreases hands-off chest time.

The usual placement of pads is anterolateral. One is put over the apex in the mid-axillary line (a finger breadth below the left nipple) and the other is placed just to the right of the sternum (a finger breadth below the right clavicle) – see below left. Ensure they are at least 2 cm apart to prevent arcing.

In the infant where anterolateral is not feasible (e.g., when pads are too close to each other), the anteroposterior placement is used: one is placed just to the left side of the sternum and the other in the middle of the back between the scapulae (above middle and right).



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Good electrode pad contact

Electrode pads should be placed on dry skin and smoothed on to guarantee good contact and ensure effective energy delivery.

Correct energy selection

The recommended level in cardiac arrest is 4J/kg.

DEFIBRILLATION – MANUAL assessment table (for centres where only paddles are available)

	Defibrillation – manual (using paddles)	Notes	Performed (Y/N)
	Basic life support should be interrupted for the shortest possible time (steps 5–12).		
1	Apply gel pads or electrode gel	Chest compressions continue	
2	Select the correct sized paddles	Chest compressions continue	
3	Turn on the defibrillator and select the energy required	Chest compressions continue	
4	Interrupt briefly to confirm VF/pulseless VT , then immediately recommence compressions	Pause chest compressions for rhythm check	
5	Shout 'STAND BACK'	Everyone stands back Oxygen removed	
6	Remove the paddles from the machine, place the paddles onto the gel/gel pads and apply firm pressure	Ensure everyone stands back and oxygen removed	
7	Shout 'CHARGING' whilst pressing the charge button.	Everyone stands back	
8	Wait until the defibrillator is charged	Everyone stands back	
9	Check that all other rescuers are clear	Everyone stands back	
10	Shout 'SHOCK, stand clear'	Check everyone clear and oxygen has been removed	
11	Deliver the shock	Everyone stands back	
12	Recommence CPR	CPR resumes	

This requires correct electrode paddle selection, correct paddle placement, good paddle contact and correct energy selection.

Correct electrode pad/paddle selection

Defibrillators for paediatric use should be supplied with two sets of electrode pads/paddles. Pads have become the method of choice, because once placed they save time, resulting in less interruption to chest compressions and time to defibrillation, and they are also safer. They promote charging during compressions which decreases hands-off chest time.

Paddles may be encountered in low- and middle-income countries. Adult paddles are 13 cm diameter. If available, paddles of 4.5 cm diameter are used in infants. Paediatric/infant paddles usually will be clipped over or hidden under the adult paddles.

Good paddle contact

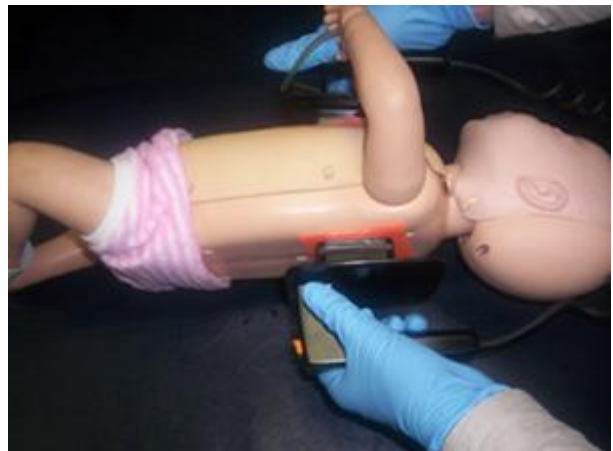
Electrode gel pads (or gel) should be placed on dry skin and smoothed on to guarantee good contact and ensure effective energy delivery. Paddles should be placed on the gel/gel pads and firm pressure applied.

Correct energy selection

The recommended level in cardiac arrest is 4J/kg.

Correct electrode pad/ paddle placement

The usual placement of both paddles and pads is anterolateral. One is put over the apex in the mid-axillary line (a finger breadth below the left nipple) and the other is placed just to the right of the sternum (a finger breadth below the right clavicle) – see below left. Ensure they are at least 2 cm apart to prevent arcing.



In the infant where anterolateral is not feasible (e.g., when pads/paddles are too close to each other), the anteroposterior placement is used: one is placed just to the left side of the sternum and the other in the middle of the back between the scapulae (above middle and right).