PRACTICAL SKILL STATION

**Defibrillation and Cardiac arrest rhythm recognition**

**KEY TEACHING OBJECTIVES**

Each candidate should receive practical instruction on the following:

1. Cardiac arrest rhythm recognition

2. The use of a defibrillator

* Capabilities
* Safety
* Delivery of a DC shock

**EQUIPMENT REQUIRED**

Resusci junior x 2

Heartsim, monitor-defibrillator or ALSi with paediatric pads x 2

IV cannula in situ

Syringes x 2

**ENVIRONMENT**

In two halves of the room set up the resuscitation manikin, heartsim, defibrillator, monitor or ALSi.

**PLAN**

\*Be positive and supportive throughout

Ensure accurate timing of the skills station - to ensure all candidates can attempt skill.

**5 mins** intro by instructors - giving time to go through monitor.

**20 mins** to allow all candidates to attempt skill (average three minutes per candidate)

**5 mins** closure (see notes below)

**SET**

"In this session I am going to teach you recognition of some cardiac arrest rhythms and the safe use of a defibrillator.”

**DYNAMIC RHYTHM RECOGNITION**

Using the three cardiac arrest rhythms, demonstrate the principles of rhythm recognition.

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| **DEFIBRILLATION, HANDS FREE** |
| This station is taught using a modification of the 4-part technique described previously in the Pocket Guide to Teaching for Clinical Instructors. The following techniques & sequence should be taught:  **“Your colleagues are performing effective CPR on a 25 kg child who has an IV cannula. The child is Covid 19 negative. Please take appropriate action.”**   |  |  | | --- | --- | |  | Apply electrode pads in correct position | |  | Selects energy required 100J (4 J/kg) | |  | Advises the plan for charging | |  | Remove free flowing oxygen, “**compressions continue & everyone else clear”**: | |  | Charge defibrillator. Once charged state **“hands off”-** rhythm check, diagnoses VF | |  | states **“stand clear”** loudly and ensures rescuers are clear | |  | Delivers shock and recommences CPR immediately | |  | Continues CPR for 2 minutes | |  | Advises plan for charging towards the end of the 2 min cycle | |  | Remove free flowing oxygen, “**compressions continue & everyone else clear”**: | |  | Charge defibrillator. Once charged state **“hands off”-** rhythm check | |  | States **“stand clear”** loudly and ensures rescuers are clear | |  | Delivers shock and recommences CPR immediately  Assistant gives adrenaline 2.5ml of 1:10 000 (10 micrograms/kg after the second shock – this may be initiated by candidate or instructor in testing)  (Instructor changes to sinus rhythm at rate of 110) | |  | Advises plan for charging towards the end of the 2 min cycle | |  | Remove free flowing oxygen, **“compressions continue & everyone else clear”** | |  | Charge defibrillator**.** Once charged state **“hands off”-** rhythm check | |  | Briefly pauses CPR to assess rhythm, (sinus rhythm) | |  | Disarm defibrillator and seek evidence for ROSC. This is indicated by presence of a central pulse and end-tidal CO2– if available. This must take no longer than 10 seconds | |

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| While there are additional steps in the shockable rhythm protocol, this skill station focuses on defibrillation. Discussion should include giving amiodarone after the 3rd shock and doses of adrenaline every second loop. |
| Management of non-shockable rhythms is not demonstrated but should be mentioned by the instructor. For example, “if after the rhythm check I observed a non-shockable rhythm I would disarm the defibrillator, **seek evidence for ROSC, if none present, recommence CPR** immediately and follow the non-shockable arm of the protocol.” |

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| **Defibrillation - Manual** |
| All APLS courses in Australia and New Zealand use hands-free defibrillators with pads. |
| If using paddles instead of pads the differences are:   1. The paddles must be placed firmly on the chest over gel pads 2. The paddles should only be charged on the chest. No CPR should be performed while charging. 3. After delivery of the shock the paddles should be immediately returned to the defibrillator. |
| During this skill station correct pad selection, correct pad placement and the safety aspects of defibrillation should be emphasised |

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| **Correct Pad Selection** |
| Standard adult automatic external defibrillators (AEDs) and pads are suitable for use in children older than 8 years. Ideally, for children between 1 and 8 years, paediatric pads with a paediatric capability should be used. Adult pads are acceptable if no paediatric pads are available |

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| **Correct Pad Placement** |
| The usual placement is antero-lateral. One pad is put over the apex in the mid-axillary line, and the other is placed just to the right of the sternum, immediately below the clavicle. |
| If the anterior-posterior placement is used, one pad is placed just to the left side of the lower part of the sternum, and the other just below the tip of the left scapula. |

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| **Safety** |
| A defibrillator delivers enough current to cause cardiac arrest. The user must ensure that other rescuers are not in physical contact with the patient (or the trolley) at the moment the shock is delivered. The defibrillator should only be charged when the paddles are in contact with the child and only discharged when in contact with the child or replaced properly in their storage position. |
| 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/turned off. |

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| **Basic Life Support**  It is important to emphasise that basic life support must recommence immediately after defibrillation. Emphasise that chest compressions and ventilations only stop for defibrillation. Chest compressions stop for the rhythm check as the rhythm cannot be seen clearly on the monitor when chest compressions are ongoing. If a drug is being given after a shock, chest compressions should be recommenced immediately after the shock and then the drug given.  **Rhythm Check**  Make it clear that there is no need to check the rhythm at any other time than indicated in the algorithm. If the rhythm at that check has changed to an apparently perfusing rhythm **then a check for** **ROSC is indicated by presence of a central pulse and (if available) end-tidal CO2**– this must take no longer than 10 seconds. If there is ROSC then post-resuscitation care given. **If there is no evidence of ROSC (or a pulse below 60 beats per minute with poor perfusion) then use the PEA algorithm**. If there is apparent asystole, check the leads and if confirmed use the asystole algorithm. This is all to prevent the cessation of chest compressions during cardiac arrest.  **Types of Defibrillation**  Ensure that candidates are aware of the use of AEDs and their limitations in children. An adult AED can be used for a child over 8 years but for a child between 1 and 8 years paediatric attenuation pads or leads should be used. For infants of less than one 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 preference for defibrillation in infants less than one year is as follows:  1. Manual defibrillator  2. AED with dose attenuator  3. AED without dose attenuator  Many AEDs can detect VF/VT in children of all ages and differentiate “shockable” from “non-shockable” rhythms with a high degree of sensitivity and specificity.  Advise candidates to familiarise themselves with the defibrillator in use at their own institution on their return to their place of work.  **Closure for manual defibrillation.**  It is vital to allow time for questions. Important concerns may be addressed at this time. There may be issues raised regarding the implications of Covid 19. Laminated guidelines will be available. There will not be time for an extensive discussion. The session can be closed by having the candidates repeat the sequence used for defibrillation.  **Assessment Technique**  Candidates will be formally assessed during the testing station later in the course. |