

Chapter 6: Cardiopulmonary resuscitation

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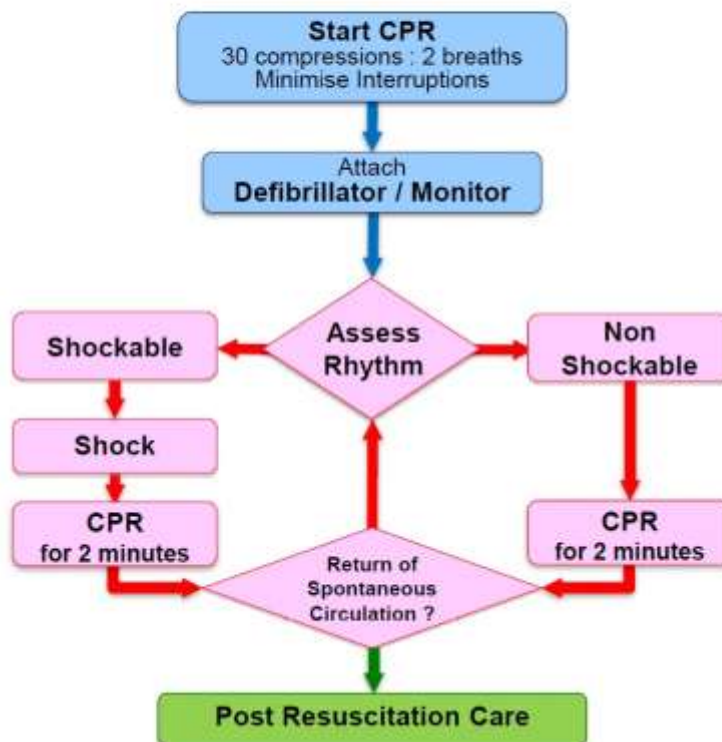
Introduction

The purpose of cardiopulmonary resuscitation is to provide some perfusion and oxygenation to the brain, which is high susceptible to hypoxic injury, and the heart to minimize damage during cardiac arrest, while more definitive treatment can be instituted. This chapter will review advanced life support that is well documented by the New Zealand resuscitation council.

Treatment limitations: To treat or not to treat

When attending a cardiac arrest situation, it is important to establish the resuscitation status, as early as feasible. Where there is no resuscitation status documented it is reasonable to initiate CPR, however, efforts should be made to establish as much information as possible. Focus should be on the acute medical problem, their medical background and functional history, just as you would for any other potential ICU patients. Please note that just because somebody is documented for CPR, it does not mean that CPR is necessarily indicated. When in doubt, talk to your consultant as early as the emergency allows.

Advanced life support in adults



During CPR

Airway adjuncts (LMA / ETT)
Oxygen
Waveform capnography
IV / IO access
Plan actions before interrupting compressions
(e.g. charge manual defibrillator)
Drugs
Shockable
* Adrenaline 1 mg after 2nd shock
(then every 2nd cycle)
* Amiodarone 300 mg after 3rd shock
Non Shockable
* Adrenaline 1 mg immediately
(then every 2nd cycle)

Consider and Correct

Hypoxia
Hypovolaemia
Hyper / hypokalaemia / metabolic disorders
Hypothermia / hyperthermia
Tension pneumothorax
Tamponade
Toxins
Thrombosis (pulmonary / coronary)

Post Resuscitation Care

Re-evaluate ABCDE
12 lead ECG
Treat precipitating causes
Re-evaluate oxygenation and ventilation
Temperature control (cool)

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In a patient where there is no evidence of output, CPR should be commenced. The algorithm above is a familiar one and it is expected that all trainees have a current ACLS certificate. In this chapter, we will highlight the important points and its particular relevance in ICU.

The cardiac arrest call out

The ICU is part of the cardiac arrest team within this hospital and in this section we will discuss how to approach this scenario. The situation is likely to be chaotic as often there will be an entourage of people around the patient. The key to a successful resuscitation is good team management. The following is a possible approach to this:

1. Ensure that help is called for and that you have the staff and the equipment that is required for ACLS. If you are part of the cardiac arrest team call out, this will hopefully have occurred.
2. Get a quick handover of the patient.
3. Ensure that CPR has commenced and that defibrillator is applied. Stop CPR only to check the rhythm and apply shock if a shockable rhythm.
4. Ensure that there is a team leader and that this has been clearly communicated to the entire team. This may be you, but could be a very capable medical registrar.
5. Delegation of roles. Important roles include airway person and assistant, Drug person and assistant, time keeper, note keeper, IV access/blood taker, someone to

review notes and a rotation of people to do chest compressions. Depending on your resource, some people will have more than one role.

6. You are likely to look after airway and breathing. Your priority is not intubation, but oxygenation and ventilation. A bag mask +/- oropharyngeal is usually sufficient, although LMA can also be used. Look at the chest rising, breath sounds and misting of the mask as evidence of ventilation.
7. Once CPR cycles has been established, you need to diagnose and treat reversible underlying causes if present.
8. Intubation equipment can be prepared and commence if this is appropriate, i.e. if this patient is an ICU candidate, there is a skilled person to do so, return of spontaneous circulation (ROSC) is not achieved rapidly and patient does not wake. If possible, a discussion with your consultant needs to occur to come to this decision. If you proceed with intubation, no drugs will likely to be required.

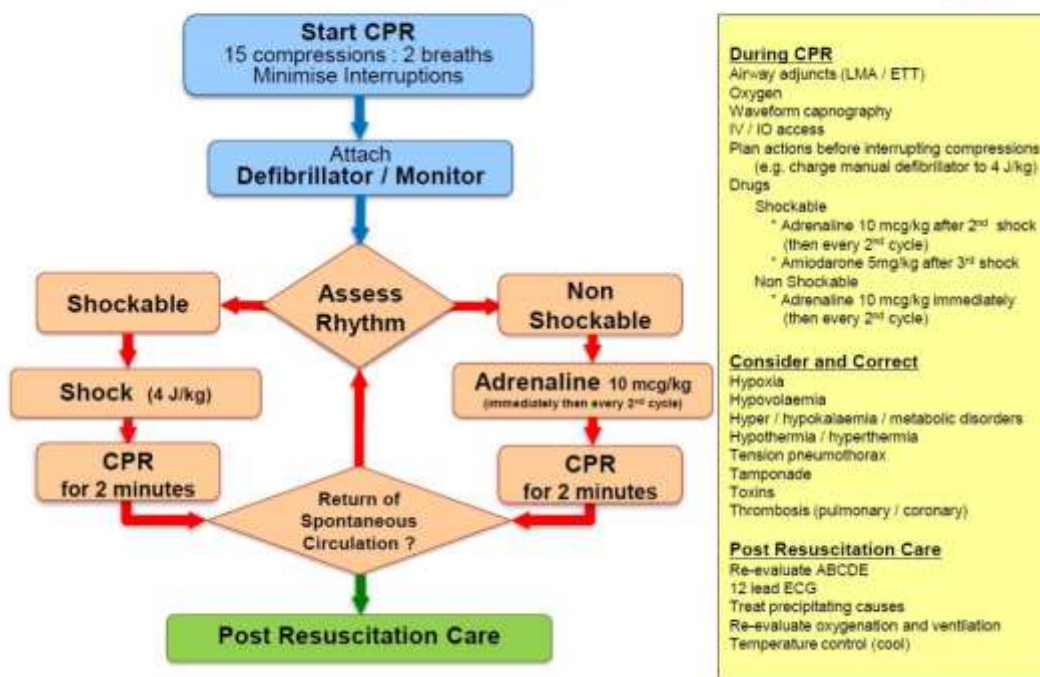
Post resuscitation care

Once ROSC is achieved, the ABCs continue to need assessment and management. If the patient has not been intubated, then you need to assess the GCS and airway protection/patency/ventilation/hypoxia for the need for intubation, if this patient is an ICU candidate. It is possible that the circulation need ongoing support and ongoing inotropes/pacing are required. At this point, a review of patient's results including 12 lead ECG, blood results, in particular, electrolytes, CXR is required. The patient may need further imaging e.g. CT-scan/Echo) or intervention (e.g. cardiac catheterisation) or be transported directly to the ICU. You should discuss with your consultant whether cooling should be applied or not to the patient.

Paediatric advanced cardiac life support



Advanced Life Support for Infants and Children



During CPR

- Airway adjuncts (LMA / ETT)
- Oxygen
- Waveform capnography
- IV / IO access
- Plan actions before interrupting compressions (e.g. charge manual defibrillator to 4 J/kg)

Drugs

- Shockable**
 - * Adrenaline 10 mcg/kg after 2nd shock (then every 2nd cycle)
 - * Amiodarone 5mg/kg after 3rd shock
- Non Shockable**
 - * Adrenaline 10 mcg/kg immediately (then every 2nd cycle)

Consider and Correct

- Hypoxia
- Hypovolaemia
- Hyper / hypokalaemia / metabolic disorders
- Hypothermia / hyperthermia
- Tension pneumothorax
- Tamponade
- Toxins
- Thrombosis (pulmonary / coronary)

Post Resuscitation Care

- Re-evaluate ABCDE
- 12 lead ECG
- Treat precipitating causes
- Re-evaluate oxygenation and ventilation
- Temperature control (cool)

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The paediatric pathway is above. The key thing about paediatric resuscitation is need help needs to be called for early. Paediatric anaesthetists should be called early to assist as they will have to most expertise in dealing with the ABCs of an arrested child. It is important to establish or at least estimate a weight, and calculate the appropriate drug doses and tube sizes for the patient. IV access may also be difficult and an interosseous line may need to be inserted.