

## Defibrillation

### Theory

Electrical defibrillation is the only effective therapy for cardiac arrest caused by ventricular fibrillation (VF) or pulseless ventricular tachycardia (VT). The American Heart Association (AHA) has long supported early attempted defibrillation, because the chances of successful defibrillation decline at a rate of 7–10% with each minute of delay.

In the hospital setting, two types of defibrillator may be encountered: the traditional manual defibrillator and the newer automated external defibrillators (AED).

There are two types of AED: most are semiautomatic and advise the need for a shock, but this has to be delivered by the operator, when prompted. Some also have the facility to enable the operator to override the device and deliver a shock manually, without any prompts. A few fully automatic AEDs are also available.

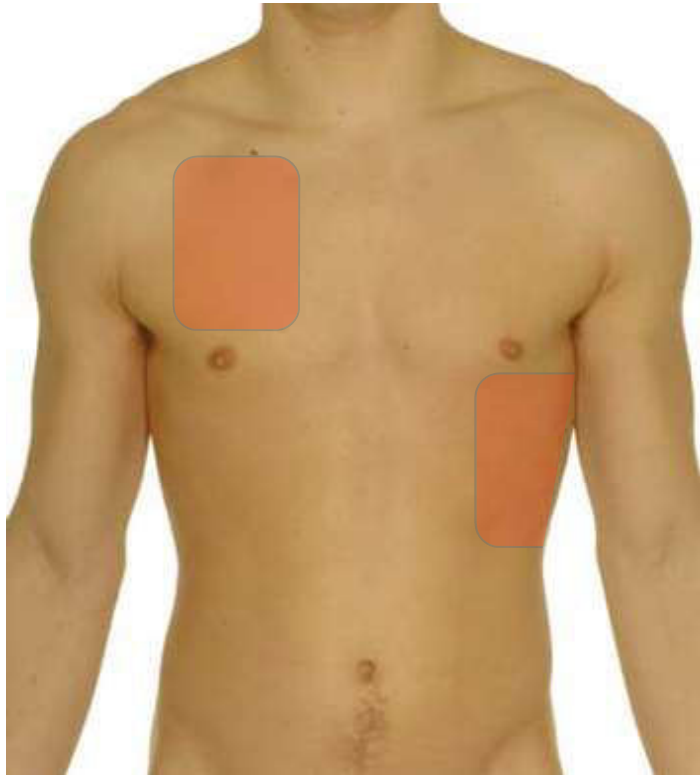
In recognition of changing guidelines, the reader is directed to the AHA Web site: [www.americanheart.org](http://www.americanheart.org) for the most current resuscitation guidelines.

### Equipment

- Defibrillator
- Gel pads

### Procedure for manual defibrillation

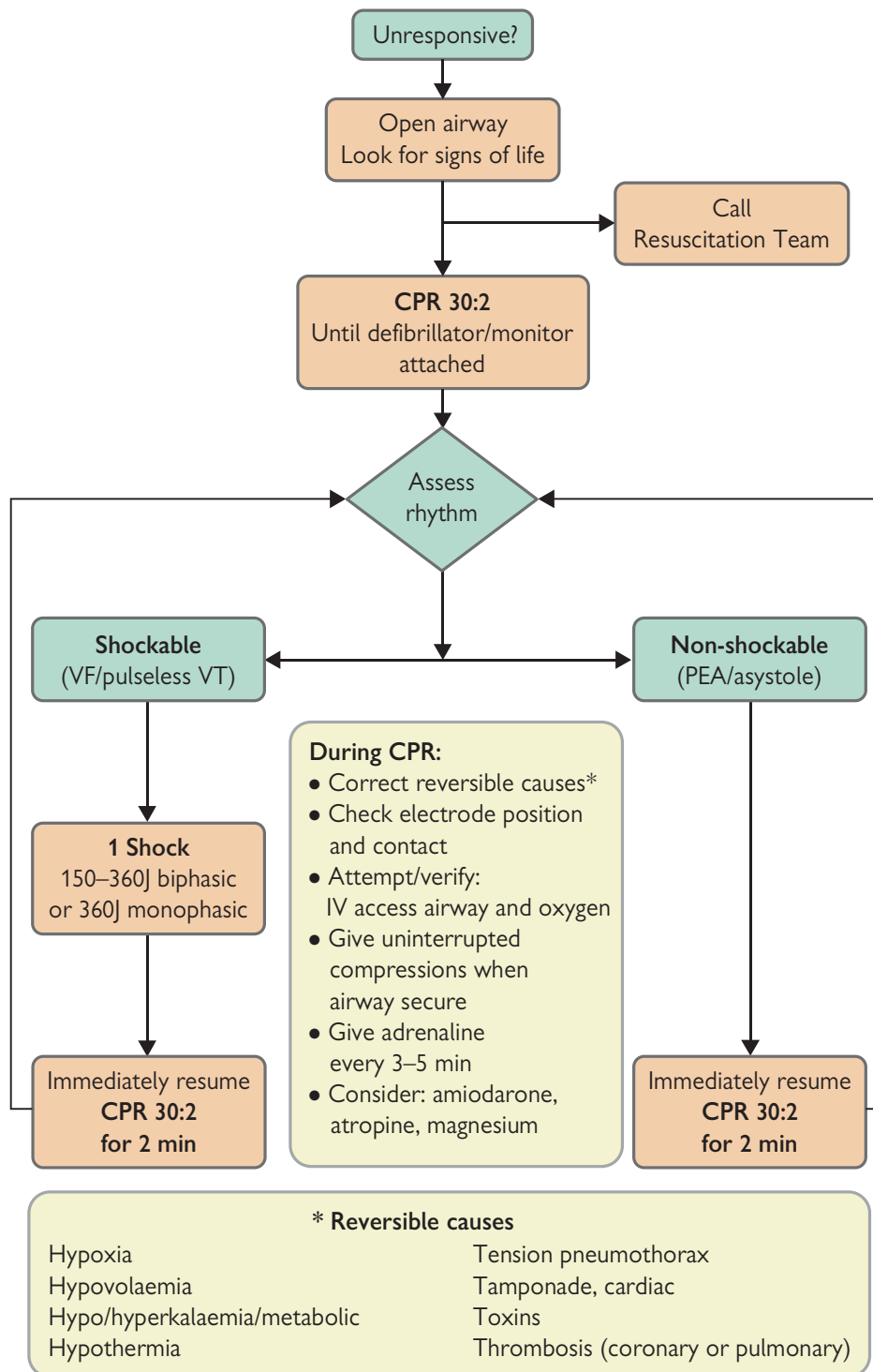
- Switch on the defibrillator and ensure that the skin is dry and free of excess hair.
- Attach the ECG electrodes accordingly:
  - Red under right clavicle
  - Yellow under left clavicle
  - Green at the umbilicus
- Ascertain that the ECG rhythm is shockable (VF/pulseless VT).
- Place the defibrillation gel pads on the patient's chest (Fig. 18.39):
  - One just to the right of the sternum, below the clavicle
  - The other just lateral to the cardiac apex
- Shave chest hair only if it is excessive and will interfere with electrical contact.
- Select 360J on the defibrillator.
- Place the paddles firmly on the gel pads.
- Press the charge button on the paddles to charge the defibrillator and shout, “**stand clear—charging.**”
- Check that all staff have stepped back (*including yourself*) and that no one is touching the patient or their bed.
- ▶ Ensure that high-flow oxygen has also been removed.
- ▶ Check the monitor again to ensure a shockable rhythm.
- Shout “**stand clear—shocking**” and press both discharge buttons simultaneously to discharge the shock.
- Follow protocol overleaf (Fig. 18.40). Return paddles to defibrillator before continuing with cardiopulmonary resuscitation (CPR).



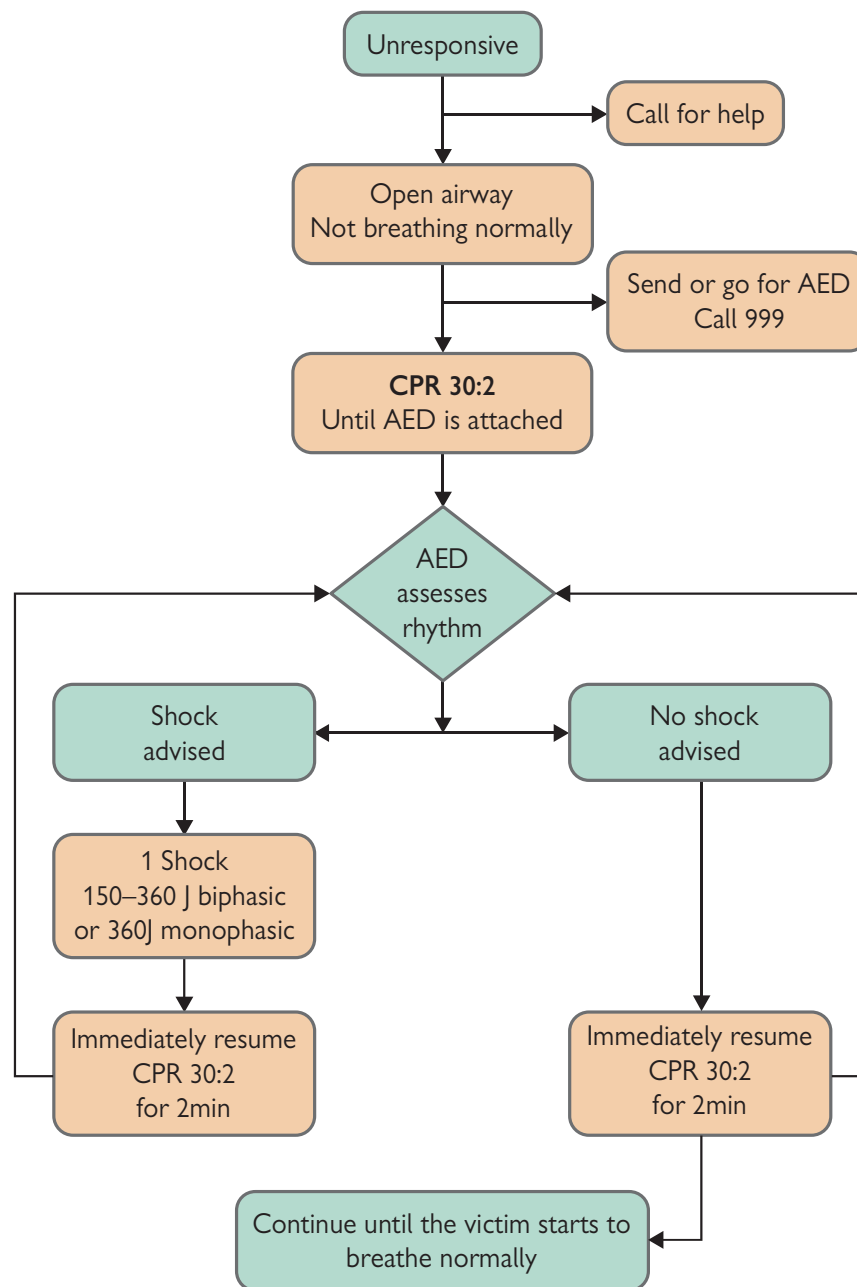
**Fig. 18.39** Correct position of gel pads or AED electrodes on patient. Ensure that they are not touching or overlying any wires, oxygen tubing, or any other conducting material. Ensure that the patient's chest is dry and shaved if particularly hairy.

### Procedure for AEDs (Fig. 18.41)

- Switch on the defibrillator, ensure the skin is dry and free of excess hair, and attach the electrode pads (same position as the gel pads in manual defibrillation; see Fig. 18.39).
  - Continue CPR while this is done if more than one assistant is present.
  - Make sure no one is touching the patient during ECG analysis by AED.
  - Follow the voice prompts.
    - These are usually programmable, and the American Heart Association recommends that they be set as follows:
      - A single shock only when a shockable rhythm is detected
      - No rhythm, breathing, or pulse check after the shock
      - A voice prompt for immediate resumption of CPR after the shock.
      - Two minutes allowed for CPR using a ratio of 30 compressions to 2 rescue breaths before a voice prompt to assess the rhythm, breathing, or a pulse is given.
- ▶ If a shock is indicated, shout “**stand clear**” and perform visual checks to ensure no personnel are in contact with the patient or their bed and that any oxygen has been removed.
- Push the shock button and continue as directed.



**Fig. 18.40** Algorithm for advanced life support using a manual defibrillator. Reproduced with permission from the Resuscitation Council (UK) guidelines. It is recommended to consult the latest AHA guidelines when available.



**Fig. 18.41** AED algorithm. Reproduced with permission from the Resuscitation Council (UK) guidelines..