

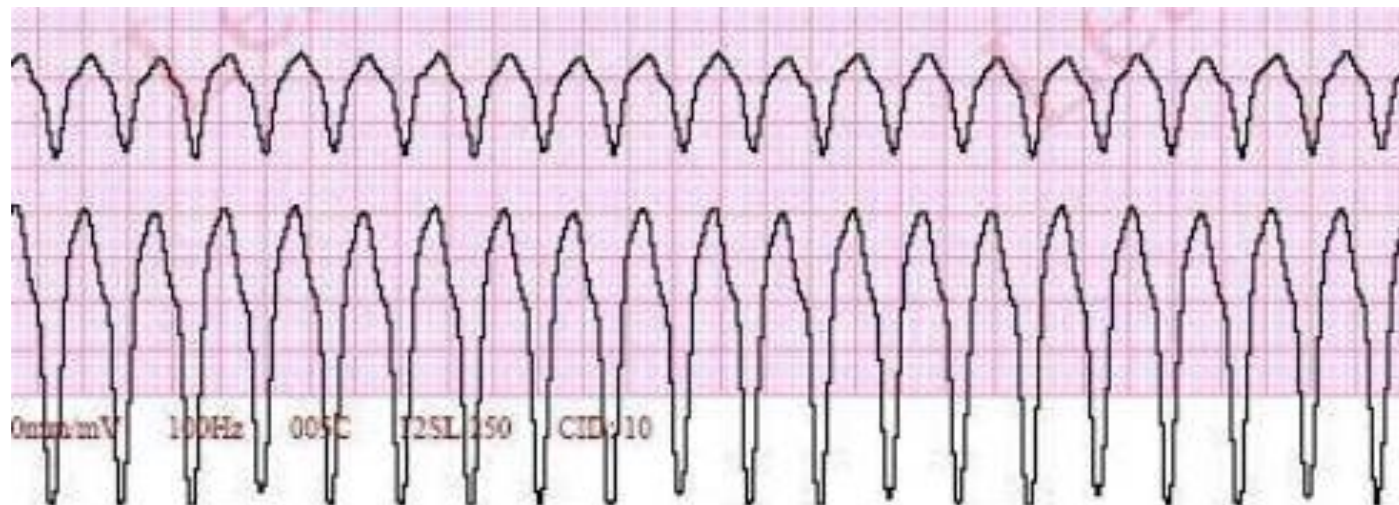
A large, irregular red ink splatter or watercolor blotch serves as the background for the text. The splatter is centered and has a textured, painterly appearance with various shades of red and some darker spots.

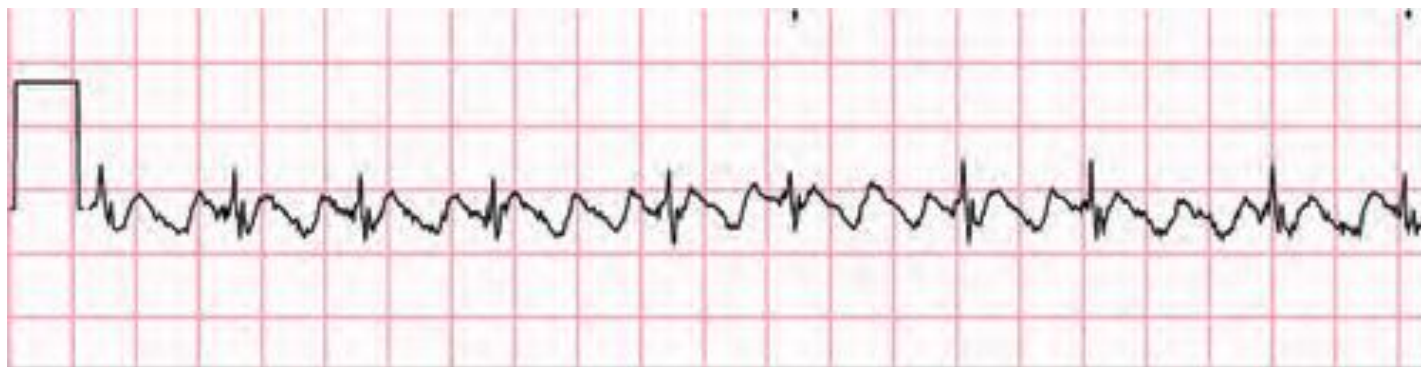
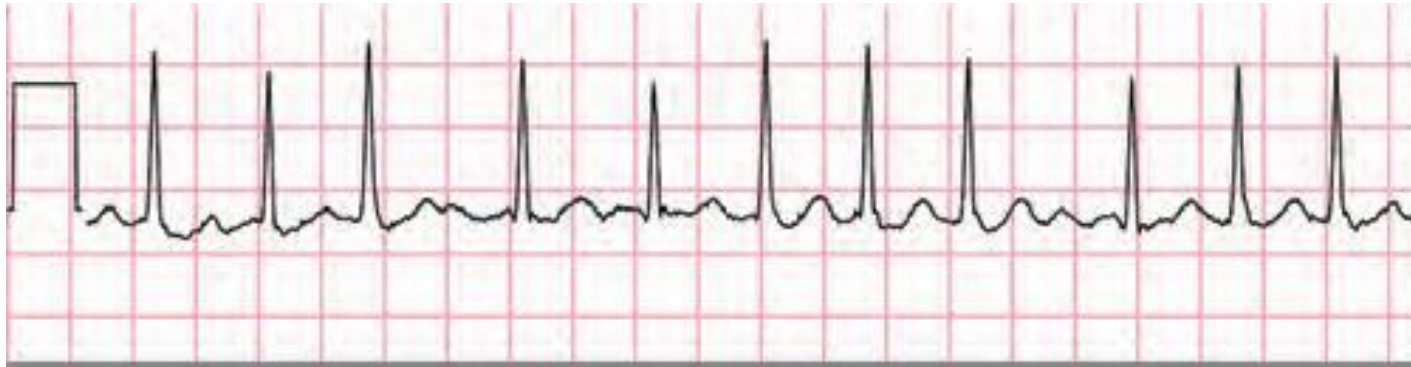
Defibrillation and Cardioversion in CPR 2020

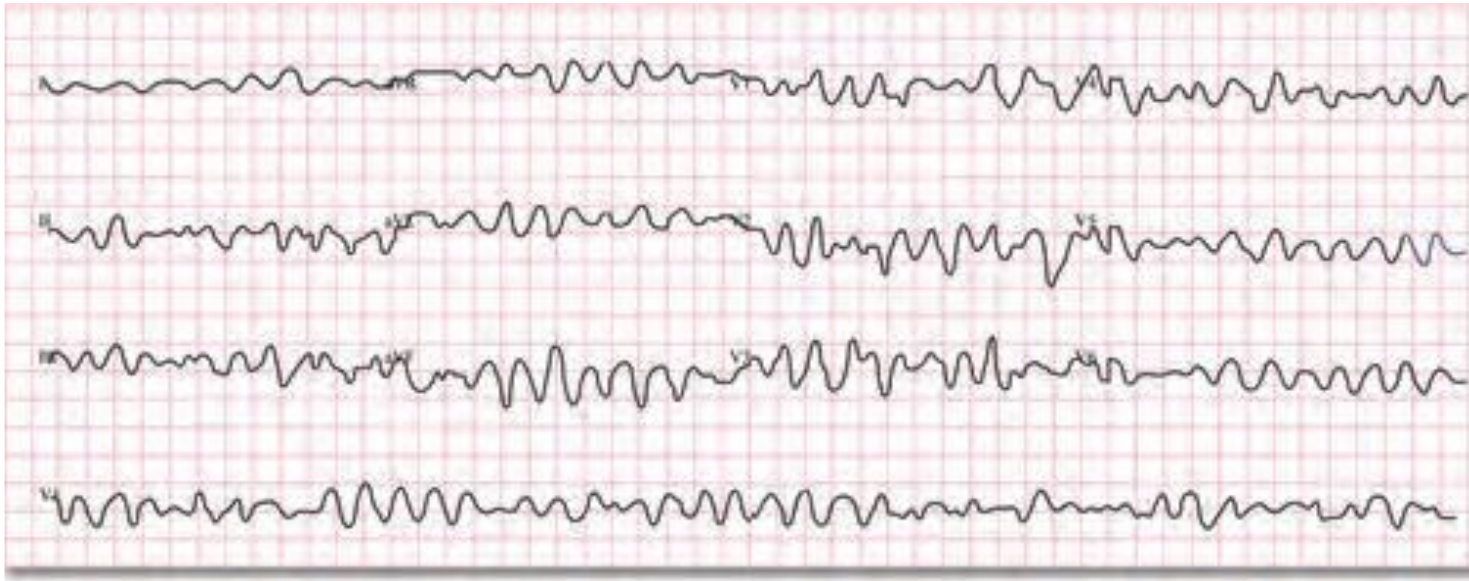
Dr S.M GHODSI MD EM



مرور ریتم







Use an automated external defibrillator equipped with a pediatric attenuator (if available) for an unresponsive, apneic, pulseless child younger than 8 years. If unavailable, use an AED with standard electrodes.





Pediatric defibrillation equipment





Defibrillation

- ▶ PAD program for OHCA
- ▶ CPR before defibrillation ?

Short time until the fibrillatory
is ready

- ▶ 3 shock ?
Old method and not
recommended anymore

Defibrillation and Cardioversion

Indications

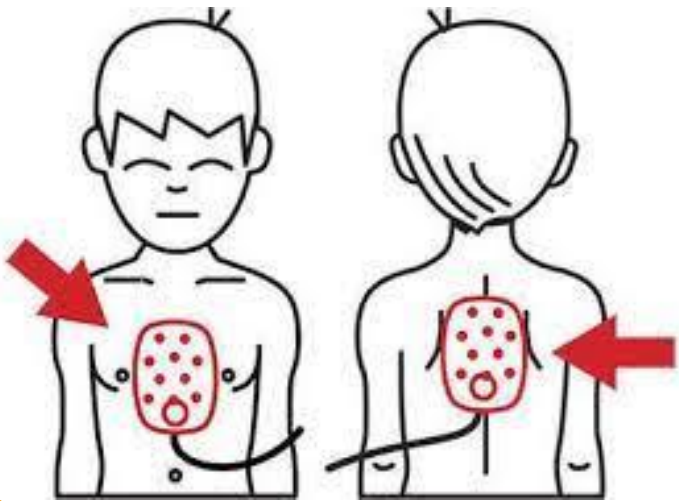
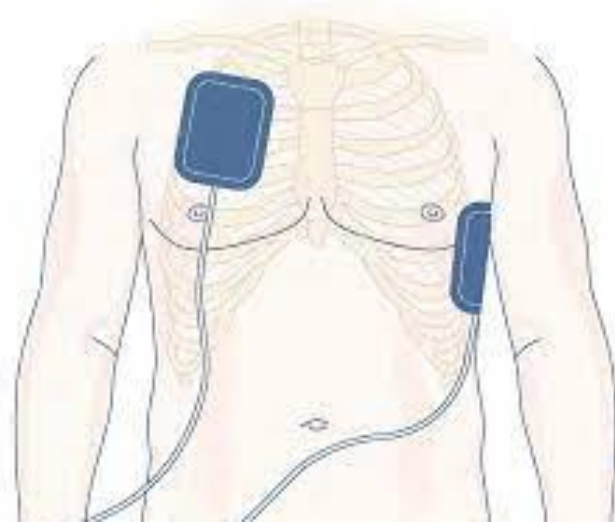
- ▶ ***Defibrillation***
- ▶ Ventricular fibrillation
- ▶ Pulseless ventricular tachycardia
- ▶ ***Cardioversion***
- ▶ Ventricular tachycardia with a pulse
- ▶ Supraventricular tachycardia
- ▶ Atrial fibrillation
- ▶ Atrial flutter

Contraindications

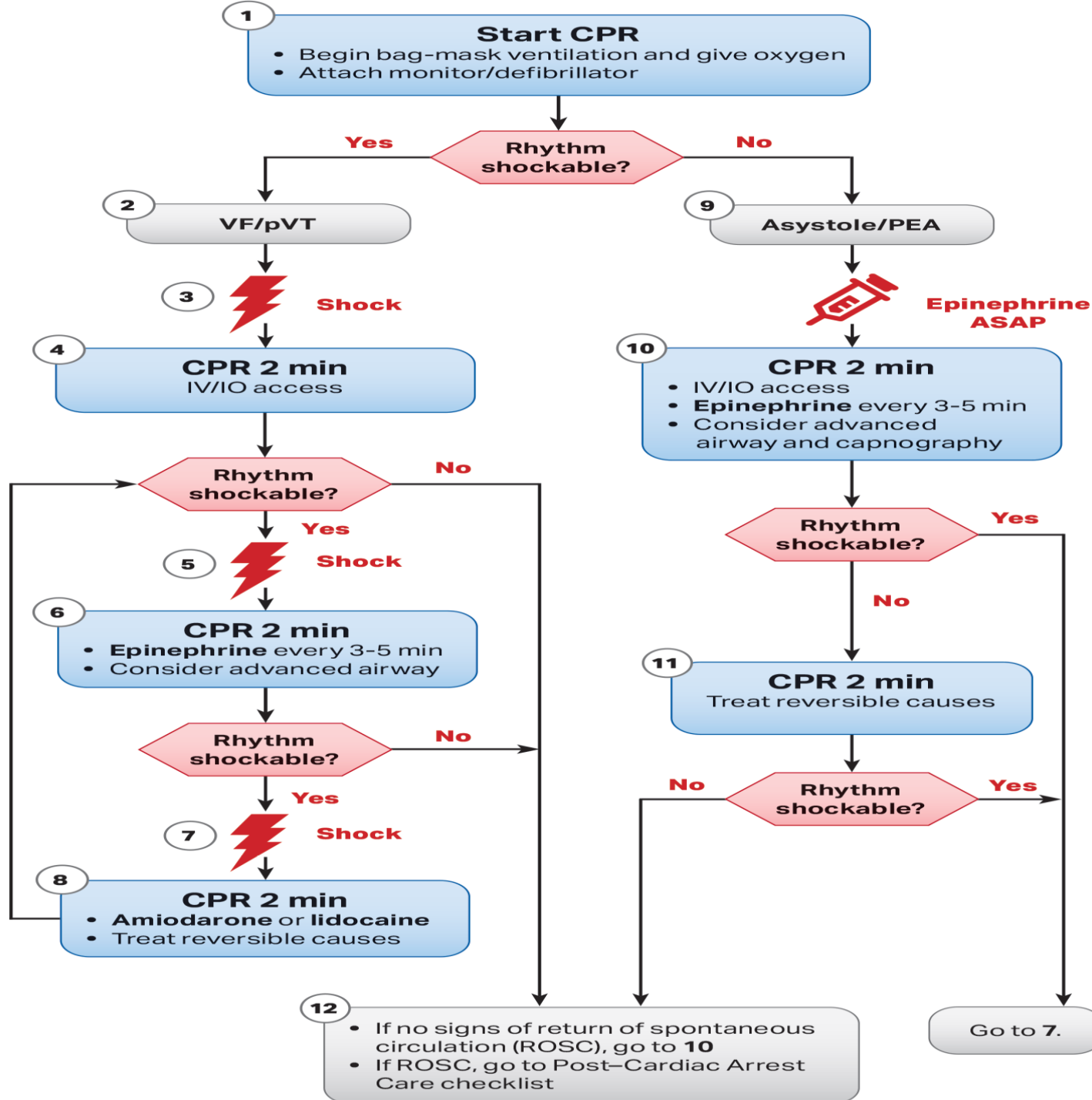
- ▶ ***Defibrillation***
- ▶ Presence of a pulse
- ▶ Asystole or pulseless electrical activity
- ▶ Obvious signs of death
- ▶ Valid do-not-resuscitate order
- ▶ ***Cardioversion***
- ▶ Arrhythmias due to digitalis toxicity
- ▶ Sinus tachycardia

Paddle Size and placement

- ▶ Anterior-lateral position
- ▶ Anterior-posterior
- ▶ In large breasted individuals
- ▶ Rapid removal of chest excessive hair
- ▶ Insufficient evidence to recommend a specific size for adult but greater than 8 cm is reasonable



Pediatric Cardiac Arrest Algorithm.



Adult defibrillation

Shock Energy for Defibrillation

- **Biphasic:** Manufacturer recommendation (eg, initial dose of 120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- **Monophasic:** 360 J

Shock Energy in Pediatrics

- ▶ First shock 2J/Kg
- ▶ Second shock 4J/Kg
- ▶ Subsequent shocks >4J/Kg , maximum 10 J/Kg or adult dose

Tintinalli 2020

TABLE 109-7 Energy Requirements for Defibrillation and Cardioversion

Rhythm	Type of Shock	Initial Dose	Subsequent Doses
Ventricular fibrillation or pulseless ventricular tachycardia	Defibrillation (unsynchronized)	2 J/kg	4 J/kg to maximum of 10 J/kg or adult dose
Unstable supraventricular tachycardia or ventricular tachycardia with pulse but poor perfusion	Synchronized cardioversion	0.5–1 J/kg	2 J/kg

Anticipatory Defibrillator Charging

► *Treatment Recommendation*

There was no treatment recommendation on timing of defibrillator charging previously, and in the absence of sufficient evidence, none was added

Double Sequential Defibrillation

- ▶ some case reports have shown good outcomes
- ▶ AHA2020 recommended against its routine use.
- ▶ Repositioning the pads may be as effective as double sequential defibrillation while avoiding the risks of harm from increased energy

Some conditions need to be considered in refractory VT

Assure oxygen is NOT flowing across the patient's chest when delivering shock

Do NOT stop chest compressions for more than 10 seconds when assessing the rhythm

Stay clear of patient when delivering shock

Assess pulse after the first two minutes of CPR

If the end tidal CO₂ is less than 10 mmHg during CPR, consider adding a vasopressor and improve chest compressions



Assess patient responsiveness, breathing, and circulation. Check for a pulse for <10 seconds. Call for help



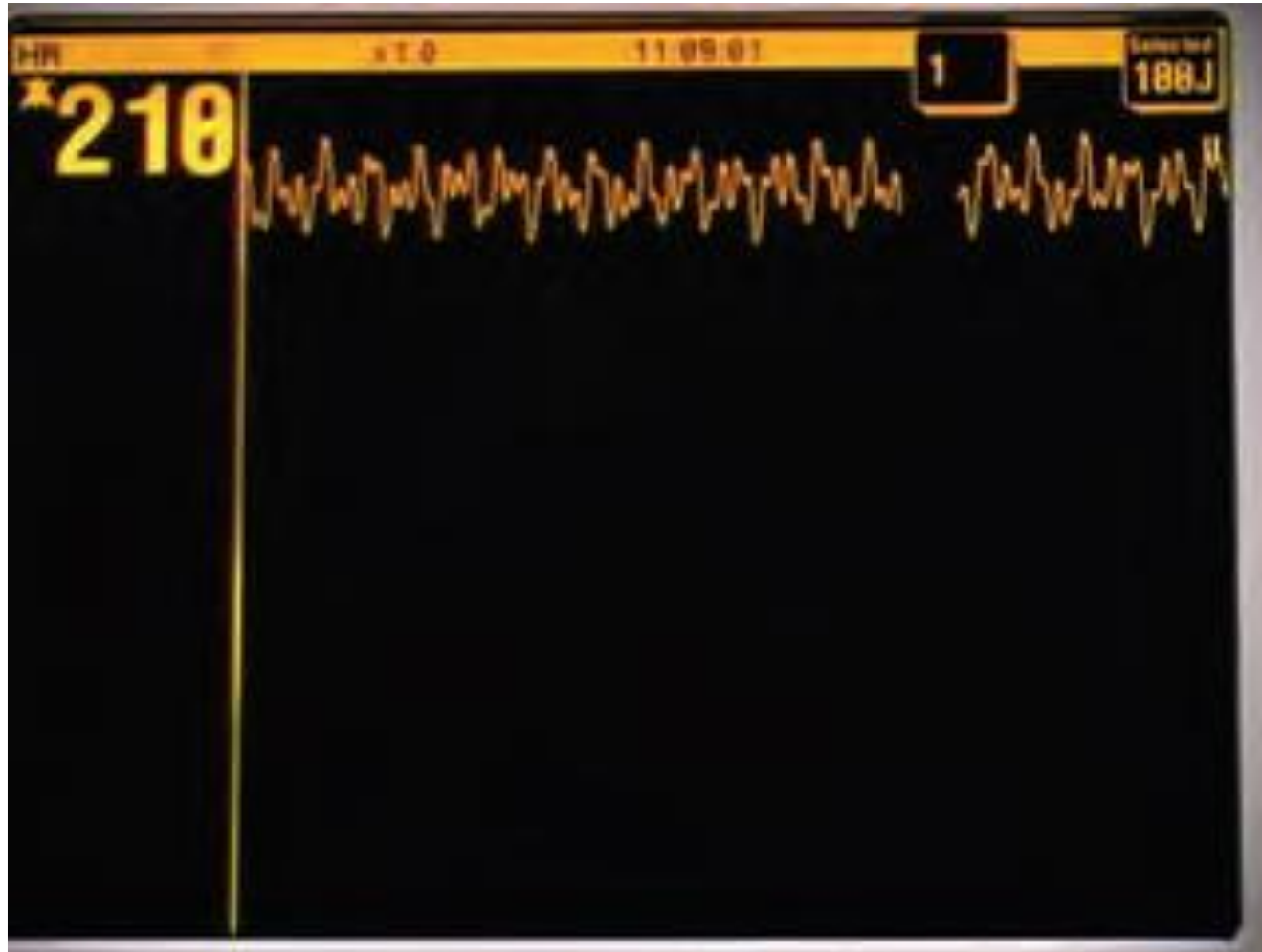
If there is no pulse, begin CPR.
Avoid interruptions in CPR, **PUSH HARD,**
and **PUSH FAST.**

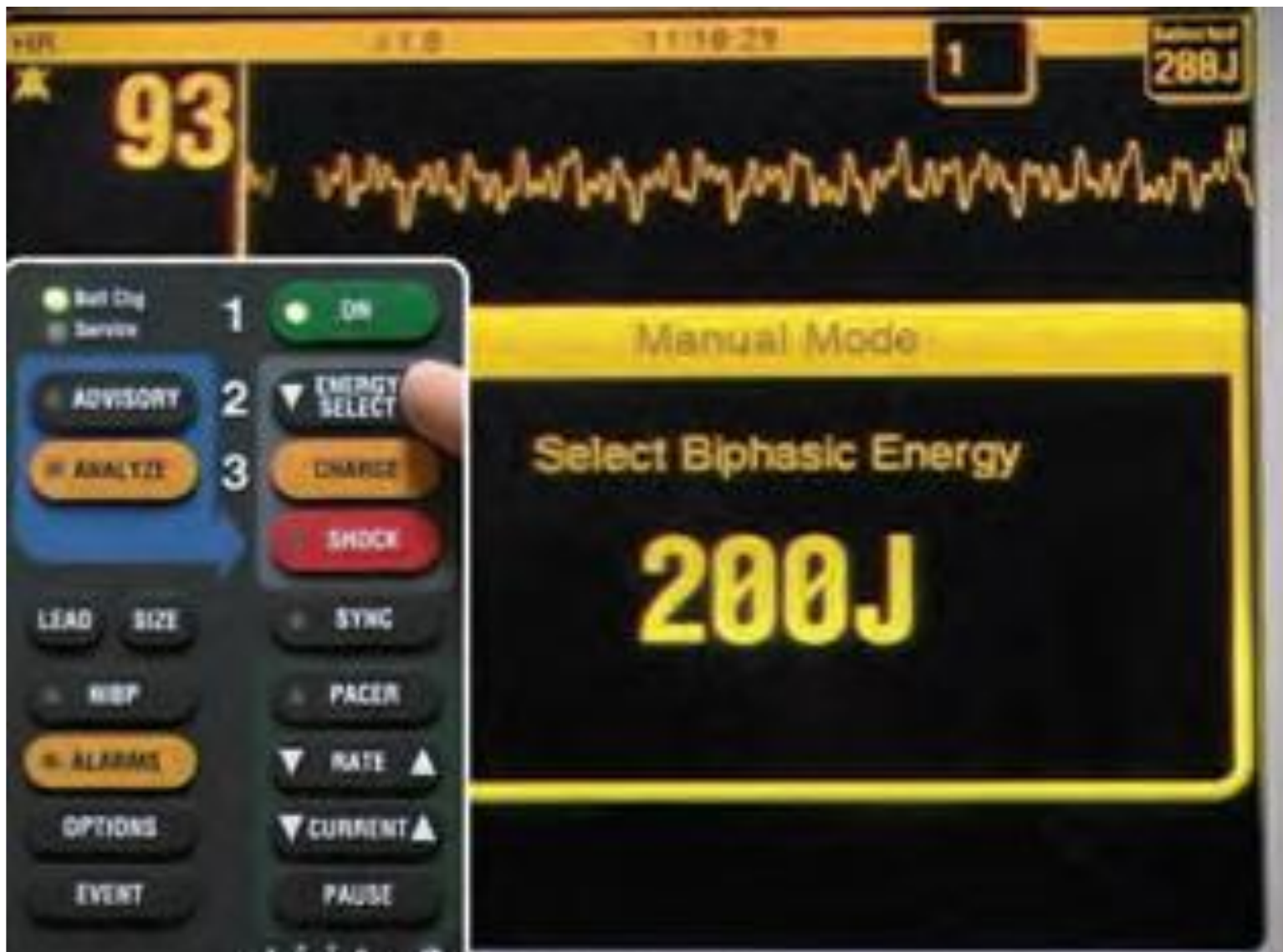


Apply the electrodes to the patient's chest. Place the sternal electrode **below the clavicle, to the right of the sternum**. Place the apical electrode in **the midaxillary line at the fifth** intercostal space.



Check the rhythm on the monitor









Resume CPR immediately and
continue for 5 cycles/2 minutes



After 2 minutes of CPR, reassess the patient and the rhythm



Double Sequential Defibrillation

- ▶ The ALS Task Force discussed whether any potential benefit might arise from increased shock energy, the fact that 2 shocks were delivered sequentially, different pad placement and vector for the second shock,
- ▶ *The study found differences in VF termination (DSD 76%, vector change 82%, and standard placement 66%) and ROSC (DSD 40%, vector change 39%, and standard defibrillation 25%).*
- ▶ This pilot RCT was **not designed to formally test differences** between the groups, and no survival data were reported..
- ▶ *Implementation of DSD requires training of staff and availability of defibrillators. monitor the intervention to determine effectiveness, and to track adverse events*

AUTOMATED EXTERNAL DEFIBRILLATOR VERSUS MANUAL DEFIBRILLATOR

► *Treatment Recommendation*

This treatment recommendation (below) is unchanged from 2010

- **No significant survival differences** have been demonstrated between defibrillation in semiautomatic and manual modes during out-of-hospital or in-hospital resuscitation;
- however, the **semiautomatic mode is preferred** because it is easier to use and may deliver fewer inappropriate shocks

Waveform Analysis for Predicting Successful Defibrillation

- ▶ *Treatment Recommendation*

- ▶ This treatment recommendation (below) is unchanged from 2010.

- ▶ There is insufficient evidence to support routine use of VF waveform analysis to guide defibrillation management in adult cardiac arrest in- or out-of-hospital