PALS Ventricular fibrillation/Pulseless ventricular tachycardia

Initiate chest compressions (see chest compressions box)
Defibrillator to bedside and apply pads
Rapid IV/IO access, monitors, supplemental oxygen
Ventilate at correct Compression:Ventilation ratio per age unless advanced airway in place, then ventilate at rate of 20-30 breaths/minute (see notes box)

↓

As soon as pads are on and team is ready
Defibrillate 2 J/kg, then immediately restart CPR

Give **Epinephrine** 0.1 mL/kg **ASAP**
- IV/IO - 0.1 mg/ml concentration

↓

After 2 minutes of CPR, perform a pulse & rhythm check

ROSC occurs → **Post-cardiac arrest care:**
Use parenteral fluids and/or vasoactive drugs to maintain SBP > 5th percentile for age

Ventilation at rate of 20-30 breaths/min; monitor $PaCO_2$; avoid severe hypercapnia or hypocapnia

Wean FiO_2 to keep sats 94-99%

Targeted temperature management: Avoid hyperthermia, keep temp ≤ 37.5°C

Admit to ICU

↓ **No ROSC & shockable rhythm[1]**

Defibrillate 4 J/kg, then immediately restart CPR
Consider advanced airway and capnography
Identify treatable causes*

ROSC occurs →

After 2 minutes of CPR, perform a pulse & rhythm check

Consider antiarrhythmic:
Amiodarone 5 mg/kg IV push (up to three doses to max of 300mg)
- ***or*** -
Lidocaine 1 mg/kg IV push

Continue **Epinephrine** every 3 – 5 minutes

Identify treatable causes*

↓ **No ROSC & shockable rhythm[1]**

Defibrillate ≥ 4 J/kg (see notes box), then immediately restart CPR
Consider advanced airway and capnography

→

Chest compressions:
Hand/finger placement just below the intermammary line

Rate 100-120 per minute

Depth: 4 cm for infants, 5cm for children, 5-6 cm in adolescents and adults

Allow recoil

Use ZOLL defibrillator and CPR coach feedback to maximize chest compression efficacy

Minimize interruptions to < 10 seconds (e.g., continue compressions while defibrillator is charging)

Rotate compressor every 2 minutes; coordinate with pulse and rhythm check

Synchronous or continuous chest compressions depend on presence of advanced airway (ETT, trach or SGD) – see NOTES below

Notes: An advanced airway is an **endotracheal tube**, **tracheostomy** or **supraglottic device**

If no advanced airway in place, coordinate compressions with ventilations at:
- 15:2 ratio for infants & children
- 30:2 ratio for adolescents (signs of puberty – breast development in females, axillary hair in males) and adults

If advanced airway in place, then continuous compressions are indicated

$ETCO_2$ monitoring may be considered to assess the quality of chest compressions, but specific values to guide therapy have not been established in children

For defibrillation, can increase J/kg up to 10 J/kg or adult maximum of 200J

[1]If non-shockable rhythm, move to PEA or asystole algorithm

Helpful Hints
Apply defibrillator pads as early as possible to assist with rhythm recognition
There is no survival benefit from high dose epinephrine given IV/IO, and it may be harmful in asphyxia
Routine administration of sodium bicarbonate or calcium is not recommended in the absence of specific indications

***Treatable Causes of arrest:**

Hypovolemia	Toxins
Hypoxia	Tamponade (cardiac)
H+ (acidosis)	Tension pneumothorax
Hypoglycemia	Thrombosis (MI, PE)
Hypo/hyperkalemia	
Hypothermia	

Adapted from 2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. This is a guideline only and has been developed by the Medical Resuscitation Committee of the Division of Emergency Medicine. **Last update Nov 2020**.