# **Singapore ACLS Guidelines 2021**

CHING Chi-Keong MBBS, MRCP (UK), FAMS, FHRS Senior Consultant, Department of Cardiology Director, Cardiac Electrophysiology & Pacing Associate Professor, Duke-NUS Graduate Medical School

on behalf of the ACLS Subcommittee, SRFAC

## 

The Singapore Resuscitation and First Aid Council (SRFAC) offers a wide range of courses and guidelines concerning modern-day CPR.



## **3rd SRFAC** Townhall









- ✓ Look for normal breathing
- ✓ Gasping
- ✓ EMS Dispatcher

✓ Quality of CPR
 ✓ Hands only CPR
 ✓ CPR training in schools

✓ PubDefi

lic Access	
ibrillation	

- High-performance √ CPR √
- **Advanced** airway
- Adrenaline

 $\checkmark$ 

Emergency drugs ECMO Targeted Temperature

Management Percutaneous coronary intervention

 $\checkmark$ 

 $\checkmark$ 



## CMEARTICLE

# Advanced Cardiac Life Support: 2016 Singapore Guidelines

Chi Keong <u>Ching</u><sup>1</sup>, MBBS, MRCP, Siew Hon Benjamin <u>Leong</u><sup>2</sup>, MBBS, MRCSEd, Siang Jin Terrance <u>Chua</u><sup>1</sup>, MMed, MRCP, Swee Han <u>Lim</u><sup>3</sup>, FRCS, FRCP, Kenneth <u>Heng</u><sup>4</sup>, MBBS, FRCS, Sohil <u>Pothiawala</u><sup>3</sup>, FAMS, MRCSEd, Venkataraman <u>Anantharaman</u><sup>3</sup>, MBBS, FRCPEd; National Resuscitation Council Singapore

**ABSTRACT** The main areas of emphasis in the Advanced Cardiac Life Support (ACLS) guidelines are: early recognition of cardiac arrest and call for help; good-quality chest compressions; early defibrillation when applicable; early administration of drugs; appropriate airway management ensuring normoventilation; and delivery of appropriate post-resuscitation care to enhance survival. Of note, it is important to monitor the quality of the various care procedures. The resuscitation team needs to reduce unnecessary interruptions to chest compressions in order to maintain adequate coronary perfusion pressure during the ACLS drill. In addition, the team needs to continually look out for reversible causes of the cardiac arrest.

Keywords: advanced cardiac life support, cardiac arrest, cardiac drugs, cardiopulmonary resuscitation, reversible causes

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# ACLS 2021 update

- Focussed modification to universal algorithm
- Recommendations for defibrillation
- ACLS in special populations
- Approaches to common tachy and bradyarrhythmias



### Danger

 Check for potential danger to provider and patient **Responsiveness** 

 Check responsiveness of patient Shout

Shout for help and activate the emergency response system lacksquare**Defibrillator** 

**Breathing & Circulation Assessment** 

• Assess breathing and pulse

#### Continuous Chest Compression (CCC)



- Call for resuscitation support: personnel, equipment and (Automated External) Defibrillator



# Defibrillation

- Biphasic waveform is preferred; start at 120J, maximum if unknown
- Monophasic waveform; 360J
- Single shock strategy
- Second and subsequent shock; escalate to maximum energy
- Double sequential defibrillation has not been established.





Airway

#### Assess breathing and pulse

# Cardiac Arrest

### **Continuous Chest Compression (CCC)**

• Start CCC (with ventilations at 10 breaths per minute, if BVM available)

### **Defibrillator**

Arrival defibrillator - Attach defibrillator pads, turn on defibrillator

### **SECONDARY SURVEY**



# Defibrillation in patients with CIEDs

- No contraindications to defibrillation
- Place defibrillation pads 1 palm length away from device (about 15 cm)
- The pacemaker or internal cardioverter defibrillator (ICD) may be reset. For post resuscitations device check and programming
- Safe to perform chest compression in patients with ICD



### SECONDARY SURVEY

#### <u>Airway</u>

• Endotracheal intubation

If unable to intubate, insert a Laryngeal Mask Airway (LMA) if available.
 Breathing

• Ventilate at 10 breaths per min. If no ETT/LMA, continue BVM.

## • Oxygenation

#### **Circulation**

- CCC is key. Pause only during the "Stop CCC" window.
- Vascular Access



1. CCC is key: interruption  $\leq 10s$ 

- 2. Confirm & monitor ETT placement
  - CO<sub>2</sub> Capnometry or waveform capnography
  - 5 point auscultation

3. IV access is preferred



## Drugs

- Adrenaline 1 mg every 3-5 mins, to given ASAP
- 2. Amiodarone 300 mg bolus, repeat bolus at 150 mg
- 3. Lignocaine as an alternative; initial bolus of 1-1.5 mg/kg, a repeat bolus 0.5-0.75 mg/kg

#### Five Hs

#### Hypoxia

- Hypovolaemia
- Hydrogen ion acidosis
- Hyper-/hypokalaemia

#### Hypothermia

#### Five Ts

Trauma

- Toxic ingestions
- Tamponade (cardiac)
- Tension pneumothorax
- Thrombosis, coronary or pulmonary

Airway

- Endotracheal intubation
- **Breathing**
- Oxygenation Circulation

**Every 2 min** 

Vascular Access

### **Drugs**

• IV Adrenaline 1 mg every 3-5 min

### <u>Refractory VF (≥3 shocks)</u>

- IV Amiodarone 300 mg, repeat once at 150 mg **Differential Diagnosis**
- Look for 5H/5T
- POCUS

### **Definitive Treatment**

• Organise and prepare for intervention if a treatable cause is found

### **SECONDARY SURVEY**

If unable to intubate, insert a Laryngeal Mask Airway (LMA) if available.

• Ventilate at 10 breaths per min. If no ETT/LMA, continue BVM.

CCC is key. Pause only during the "Stop CCC" window.





## **Post-resuscitation Care**

- 1. Targeted temperature management
- 2. Emergent percutaneous coronary intervention
- 3. Maintain blood pressure
- 4. Avoid hypoxemia/ hyperoxia & maintenance of normocarbia
- 5. Active seizure detection and treatment
- 6. Neuroprognostication



- Survival rate of cardiac arrest associated with drowning is 13%
- Duration and severity of hypoxia is the most important determinant of mortality
- Rescue breathing should be prioritised
- Chest compression as per BCLS protocol
- To evacuated to hospital for tertiary care

# ACLS in Drowning

# ACLS in Pulmonary Embolism

- Is a treatable cause of cardiac arrest
- Often present as pulseless electrical activity
- Systemic thrombolysis or surgical / percutaneous mechanical embolectomy
- For cardiac arrest where PE is suspected, empirical thrombolysis may be considered

- Best outcome for both mother and foetus are through successful maternal resuscitation
- Common causes include haemorrhage, eclampsia, amniotic fluid embolism, heart failure, sepsis, aspiration pneumonia, pulmonary embolism.
- Standard BCLS and ACLS should be performed

# ACLS in Pregnancy

- An advanced airway is required to optimise ventilation and oxygenation
- When fundal height reaches the level of the umbilicus, continuous left lateral uterine displacement during resuscitation to avoid decreased venous return from aortocaval compression
- ECMO and TTM as indicated.
- No indication for foetal monitoring during maternal resuscitation
- Perimortem caesarean delivery (PMCD) during cardiac arrest for women in the second half of pregnancy is associated with return of spontaneous circulation (ROSC) and improved neonatal survival

# ACLS in Pregnancy





# ssory pathway





Low threshold to sedate and synchronised cardioversion



## ort tolerance https://fb.watch/1QqwCuBDgD/ V4Narrow QRSD V5 V2 Ventricular rate 40 bpm **V**3 V6 'ary? AV dissociation 900 1020





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- Dr Francis Lee

# BRINGING RESUSCITATION TO THE WORLD

The Singapore Resuscitation and First Aid Council (SRFAC) offers a wide range of courses and guidelines concerning modern-day CPR.



- Prof Lim Swee Han
- Dr Lim Toon Wei
- Dr Mak Koon Hou
- Prof Eillyne Seow
- Dr Sewa Duu Wen
- A/Prof Yeo Khung Keong



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