

## COMMENTARY

## RESUSCITATION

# 'Resuscitation Council UK Guidelines 2021' – a short commentary

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## Abstract

New Resuscitation guidelines have been published this year by Resuscitation Council UK (RCUK). Its the commentary and comparison of changes to the previous guidelines of BLS, ALS, PLS and PALS The new topics are also added in new guidelines and details are in full text

**Key words:** OHCA: out of hospital cardiac arrest, IHCA: in hospital cardiac arrest. BLS: Basic life support, ALS : advanced life support PLS: Pediatric life support PALS: pediatric advanced life support

**Abbreviations:** CPR–Cardiopulmonary resuscitation; OHCA–Out-of-hospital cardiac arrest; IHCA–In-hospital cardiac arrest; PEA–Pulseless electrical activity; ROSC–Return of spontaneous circulation; ILCOR–International Liaison Committee on Resuscitation; NICE–National Institute for Health and Care Excellence

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## 1. Introduction

The annual incidence of out-of-hospital cardiac arrest is different in developed and developing world. It can occur at odd timings and places. Most of these out-of-hospital cardiac arrests are witnessed by someone who can be a family or a colleague - A bystander. In this recent guideline, emphasize is being given to the education of public, as quite high number of these out-of-hospital cardiac arrest in adults are of cardiac origin and timely CPR can greatly reduce the mortality.

In developed countries, due to improve public health education bystander CPR is common practice and to improve outcomes more, facilities to provide portable defibrillators are increasingly overviewed. Public health education is still an issue in developing countries; it can ameliorate mortality outcomes by many folds.

Resuscitation Council UK's Guidelines continues to evolve thereby increasing the essential knowledge needed by healthcare providers in effective resuscitation. These guidelines can also be used to improve the perspective in developing world, by focusing on what resources are available and still can enhance outcomes, and involving public sectors in education process to review and make available the essentials, which can in turn improve public health care.

## 2. Adults

### 2.1. BLS (Basic Life Support)

It is essential for the reader to understand the basics of resuscitation and be familiar with the previous UK resuscitation guidelines published in 2015. The new

guidelines do not signify a major shift from the current practices but rather are a continuation of the previous guidelines with minor changes and special emphasis of some important points.

In the 2021 guidelines, adult BLS is more or less the same. The importance of recognizing a cardiac arrest is of utmost importance and is fundamental to generate an emergency response. There must be no delays in initiating chest compressions and should be done as soon as possible. The emergency call handler not only helps in identifying the cardiac arrest but also guides through the process of chest compressions and using an automated external defibrillator (AED). The location of these AEDs can also be found on The British Heart Foundation database.

## 2.2. ALS (Advanced Life support)

The majority of the 2021 Adult ALS Guidelines remain unchanged as well. There is a greater emphasis on the recognition of premonitory signs before the cardiac arrest whether it be IHCA or OHCA. A major chunk of these cardiac arrests may be prevented by recognizing these signs. High-quality chest compressions with minimum interruptions and quick defibrillation are again the integral parts of the ALS approach.

### 2.2.1. Adrenaline:

For a shockable rhythms, it is advised to administer adrenaline only after 3 defibrillation attempts have been made. On the contrary, it must be administered immediately in non-shockable rhythms.

### 2.2.2. Airway:

In the airway management, it is now recommended that if tracheal intubation is to be attempted then it should be done by an expert hand.

### 2.2.3. New Topics (Special Circumstances):

New topics of obesity, mass casualty incidents and cardiac arrest in sport have been made a part of the guidelines. Furthermore, the guidelines on anaphylaxis have been reformed as per the recent national updates.

## 2.3. Post Resuscitation Care:

When compared with the 2015 guidelines, little has changed in the post resuscitation care literature. The European Society of Cardiology guidelines for immediate coronary angiography have been integrated for patients who do not have ST-elevation on their 12-lead ECG post-resuscitation.

### 2.3.1. Drugs & Targeted Temperature Management

Following ROSC, mean arterial blood pressure (MAP) should be kept above 65 mmHg. Use of Levetiracetam and sodium valproate is recommended in place of phenytoin. All adult cardiac arrest victims who remain unresponsive must undergo Targeted Temperature Management (TTM). As per the recent guidelines, the temperature must be maintained between 32 and 36 °C for a minimum of 24 hours, and fever should be avoided for at least 72 hours after return of spontaneous circulation.

### 2.3.2. EEG

Predictors for poor outcome have been identified which include absent corneal and pupillary reflexes even after 72 hrs, absence of N20 SSEP wave after 24 hours, a malignant EEG after 24 hours among others. A predominant anoxic injury of the brain confirmed on CT scan or MRI also depicts poor outcomes in patients who have a GCS of 3 or less.

## 3. Pediatrics

### 3.1. PLS (Pediatric Life Support)

In the pediatric basic life support sequence, rescuer should continue the practice of assessing for signs of circulation and breathing simultaneously. Chest compressions should ensue without any further delays if there are no signs of life.

#### 3.1.1 Mobile phone speaker:

In the new guidelines, it is encouraged to utilize the speaker function of the bystander's mobile phone so that the bystander doesn't have to delay or compromise CPR while contacting emergency medical services.

### 3.2. PALS (Pediatric Advanced Life Support)

The pediatric ALS guidelines have seen some changes according to the recent guidelines. Use of capnography is deemed essential once a definite airway is in place. It is now recommended to provide continuous chest compressions once the child has been intubated using an ETT. The number of breaths per minute in such scenarios has been described in detail in the guidelines.

#### 3.2.1. Intravenous Fluids & Vasopressors

The recent guidelines suggest cautious use of IV fluids in the pediatric population and frequent monitoring to avoid fluid overload. Balanced isotonic fluids are the

fluid of choice but depending upon availability, normal saline can be used. Blood products are to be transfused early to prevent coagulopathy. For patients in circulatory shock, a fluid bolus of 10 ml/kg can be given and can be increased to a maximum of 20 ml/kg for patients with hemorrhagic shock. Meanwhile, patients with febrile illness who do not have any signs of shock must not be treated with fluid boluses. In children and infants with persistent cardiovascular impairment after multiple fluid boluses, vasopressors should be started as early as possible through a central line. Adrenaline and noradrenaline are the preferred drugs of choice. Dopamine must not be used as a first choice unless the aforementioned drugs aren't available. PALS instructors should have the required expertise to use these drugs.

#### 4. NLS (Neonatal Life Support)

The new born resuscitation has seen some minor updates which are mentioned here. It is recommended that cord should not be clamped for at least 1 minute. But, if for some reason this is not an option, cord milking can be done for gestational age of more than 28 weeks. It is now discouraged to attempt an immediate laryngoscopy in babies who are born with meconium. If face mask or an endotracheal intubation fails, a laryngeal mask can be used in infants who weigh more than 2000g or more than 34 weeks of gestation. When supporting ventilation in premature babies, the initial pressure should not be less than 25 cm H<sub>2</sub>O. Premature infants should initially be ventilated with 30% oxygen while full term babies should receive air.

In emergency situations, umbilical IV access is the preferred choice but intraosseous IV access is also acceptable in absence of IV access. The dose of adrenaline is now 0.2 mL kg<sup>-1</sup> of 1:10,000 adrenaline (20 micrograms kg<sup>-1</sup>) which may be repeated every 3-5 minutes. In case of a failed resuscitation attempt, stopping the CPR may be discussed after 20 minutes but only after excluding reversible causes.

#### 5. Education and Ethics

Apart from the above mentioned guidelines, special emphasis has been placed on education and ethical concerns. Accredited life support courses must be

conducted as they are proven to improve outcomes in life and death situations. Development of a skilled faculty is of utmost importance to improve education. Every person must be able to provide the basic skills to save a life through these courses. According to these recommendations, cardiac arrest survivors should be screened for physical, cognitive and emotional problems and referred to a rehabilitation unit if needed.

#### 6. System Saving Lives (new section)

A new section in the guidelines "systems saving lives" describes a number of system-level factors that can improve the management of cardiac arrest patients. They emphasize on the governments and health managers working in tandem with the healthcare professionals to educate and teach the masses. It is stressed that social media platforms and mobile phone applications should be utilized to reach out to the general public.

Community initiatives like "restart a heart" should be encouraged and promoted, as well as CPR training is to be taught to school going children. The integration of all these systems can improve outcomes, especially in OHCA's.

#### 7. Conclusion

New 2021 guidelines include points that can improve cardiac arrest outcome. Audience should include governments, health and education systems, healthcare professionals, teachers, students and members of public.

With the advancement of technology, masses are encouraged to join via social media and smartphone apps. Community initiative (e.g. Restart a Heart) should include CPR promotion and children should have mandatory CPR training once a year. Role of Ambulance service dispatcher is again vital along with advancements in cardiac arrest centers.

Emphasis has been given to education as it can improve patient outcome. To maintain the quality of education, faculty is vital. Moreover, ACLS education should be given to all as it is a basic life-saving skill. From ethical point of view; communication and counselling is advocated with patients and family.

Support should be offered for family members who have witnessed resuscitation efforts on patient.

Adult BLS contain no major changes in this guideline; with importance of early recognition still remains on priority followed by initiating the emergency response system and early CPR.

Adult Life support also contain no major changes in 2021 guidelines. High quality chest compressions with minimal interruptions and early defibrillation is of utmost importance. Identification of reversible cause of cardiac arrest include new topics i.e, Obesity, Mass casualty incidents, cardiac arrest in sports and anaphylaxis.

A few changes in post resuscitation care are of coronary angiography in non-ST elevation ECG post resuscitation. After ROSC mean arterial pressure should be more than 65mmHg. Update of multimodal prognostic guidelines.

Pediatric advanced life support include airway management with capnography, fluid and vasoactive drug guidelines.

New born Resuscitation include minor changes; airway guidelines use of laryngeal mask airway and ventilation strategies.

## 8. Recommendations

Guidelines 2021 does not include any major changes in comparison to 2015 guideline.

Use of technology to engage masses and educate them the process of resuscitation is commendable. Continuous education for public sectors other than healthcare system is also a step which should be encouraged. Use of resuscitation education for students and yearly training, will make a huge impact in the outcome of out of hospital cardiac arrest scenarios.

## 9. Authors' contribution

RR: Introduction writing & History

MAA: New guidelines

FA: Conclusion discussion

RSD: Concept, correction, motivation

## 10. References

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