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SRFAC: resuscitation and saving lives in the COVID-19 era and beyond

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FROM NRC AND NFAC TO SRFAC

James Elam, Peter Safar and William Kouwenhoven proved that exhaled air ventilation, mouth-to-mouth ventilation and closed chest compressions, respectively, were effective in the treatment of cardiac arrest casualties.(1-3) Together with the invention of automated external defibrillators (AEDs) in the late 1970s, they revolutionised the management and outcomes of patients with cardiac arrest.(4)

As advances in first aid and cardiopulmonary resuscitation (CPR) continued to improve care and survival both in out-of-hospital cardiac arrest and in-hospital cardiac arrest (OHCA), we, as an international community, continue to collaborate and learn from one another. The International Liaison Committee on Resuscitation (ILCOR), which comprises regional resuscitation councils across the world as well as first aid and resuscitation volunteer members who are experts in their respective fields, has established evidence-

driven consensus statements based on the science and evidence to date.(5) These scientific consensus statements are then translated and adapted into guidelines for implementation and practice in respective communities by resuscitation and first aid councils across the world.

These collaborations have benefitted Singapore's OHCA survival and public participation rates. From 2011 to 2016, Utstein (bystander witnessed ventricular fibrillation arrest) survival rates nearly doubled from 11.6% to 23.1% ($p = 0.006$). Overall survival rates improved from 3.6% to 6.5% ($p < 0.001$). Bystander CPR rates more than doubled from 21.9% to 56.3%, and bystander AED rates also increased from 1.8% to 4.6%.(6)

Before April 2018, there were two councils overseeing the conduct of resuscitation and first aid courses in Singapore. The National Resuscitation Council (NRC) was established in 1988 and promoted the teaching of basic resuscitation skills to the public, such as CPR and use of AEDs, while providing guidelines for advanced resuscitation courses such as Advanced Cardiac Life Support (ACLS), Life Support Course for Nurses (LSCN), and Paediatric and Neonatal Life Support courses. In 2000, the National First Aid Council (NFAC) was established to oversee Standard First Aid and Child First Aid courses in Singapore. NRC's founding Chair was Dr Teo Wee Siong and the immediate past Chair was Prof Anantharaman Venkataraman, while NFAC's Chair was Prof Goh Lee Gan.

On 1 April 2018, the Ministry of Health, Singapore (MOH) merged NRC and NFAC to form the Singapore Resuscitation and First Aid Council (SRFAC) to take over the role of accrediting training centres (TCs) that conduct resuscitation and first aid courses, and it remains as part of the MOH unit for Pre-hospital Emergency Care. SRFAC is supported by the following subcommittees: Basic Cardiac Life Support and Automated External Defibrillation (BCLS+AED); ACLS; Paediatrics; Neonatal; LSCN and First Aid.

As of March 2021, SRFAC has more than 100 accredited TCs, with about a dozen organisations seeking accreditation. Approximately 30 of these TCs are based in healthcare institutions, institutions of higher learning, the Singapore Armed Forces and the Singapore Civil Defence Force (SCDF), with the rest being commercial TCs and non-profit organisations.

SRFAC is a member of the Resuscitation Council of Asia (RCA), and its key appointment holders are actively involved in ILCOR.

RESUSCITATION AND FIRST AID TRAINING DURING COVID-19

With the outbreak of the COVID-19 pandemic in early 2020, SRFAC released various advisories (www.srfac.sg) advising appropriate precautionary and infection control measures to protect the health and well-being of their learners and staff, including wearing of masks at all times; staggered reporting and break times for multiple classes; fixed assignment of instructors and learners to small groups; disinfection of hands before and after practice sessions or after breaks; safe distancing between individuals and small groups during practice; adjusting the instructor-to-learner ratio to 1:4; disinfection of manikins and training aids before and after use; and daily cleaning and disinfection of training space and common touch points.

RESUSCITATION GUIDELINES FOR SINGAPORE 2021

Much has transpired since our last Singapore resuscitation and first aid guidelines were issued by the NRC in 2017.(7) Even as the battle against COVID-19 rages on in 2021, we will continue to improve resuscitation and first aid care within our community. This special issue covers all the key resuscitation and first aid guidelines from the newborn to the child and adult.

BCLS+AED

There has been increasing emphasis on the role of dispatcher-assisted CPR and quality of bystander CPR. Combined with hands-only CPR, the first few minutes of response by community responders and Emergency Medical Services (EMS), i.e. SCDF dispatchers, create a robust initial response to OHCA casualties, improving survival outcomes.(8)

First aid

It is recommended that the administration of inhaled bronchodilators be taught to first aiders. With the increased use of self-administered adrenaline auto-injectors, the use of this equipment and the dangers of anaphylactic shock have been emphasised. Commercial tourniquets are recommended for severe limb haemorrhage and amputations, while indirect pressure and elevation of extremities are no longer indicated for bleeding control. There are also revisions to treatments for heat disorders and jellyfish stings. Although the recovery position is not recommended for unresponsive OHCA casualties after return of spontaneous circulation (ROSC) with normal breathing, as it may hinder the detection of a subsequent cardiac arrest before the arrival of the EMS, it is still recommended for unresponsive casualties with pulse and normal breathing such as those with stroke or seizures.(9)

ACLS, post-resuscitation care and extracorporeal membrane oxygenation

ACLS follows BCLS as the fourth link in the chain of survival. With good-quality BCLS starting from the community or general wards as the foundation, ACLS emphasises the use of advanced airway management and ventilation, circulatory support, appropriate use of drugs in resuscitation, and identification of reversible causes of cardiac arrest. Additionally, ACLS covers the recognition and management of unstable pre-arrest tachy- and brady-dysrhythmias that may deteriorate further. Lastly, resuscitation does not end with ACLS but must continue in post-resuscitation care.(10)

A precisely executed chain of survival is critical for neurologically intact survival after cardiac arrest, but the chain is only as strong as its weakest link. Achieving ROSC is not an end in itself but the start of a delicate journey of improving a patient's eventual clinical outcome. The Singapore National Targeted Temperature Management Workgroup summarises recent advancements in post-cardiac arrest management, including the use of advanced neurological monitoring and the importance of a good-quality intensive care unit care in the post-ROSC period.(11) Post-cardiac arrest care in the intensive care unit with a well-orchestrated, multidisciplinary, multisystemic approach is crucial for overall good prognosis.

Extracorporeal membrane oxygenation (ECMO) CPR (ECPR) as a bridge to bundled post-cardiac arrest care for refractory OHCA casualties has been reported to show improved survival-to-discharge and neurological outcomes for highly selected cases (e.g. witnessed arrest with bystander CPR, short down-time with shockable rhythms). These highly complex interventions require well-drilled multidisciplinary teams to rapidly emplace patients onto ECMO and to deliver post-cardiac arrest care in high-volume ECMO centres, in order to see this benefit. ECMO remains a costly intervention with significant complications; hence, care must be taken in case selection while balancing the risks versus benefits and cost-effectiveness when designing an ECPR response system.(12)

Paediatrics

A framework using the 'paediatric chain of neurologically intact survival' is used to provide guidance in paediatric life support. The use of adult recommendations for paediatrics has been changed from above eight years of age to above 12 years of age. There is also continued emphasis on ventilation for both paediatric basic and advanced life support. The provision of ventilation during paediatric cardiac arrest has been associated with more favourable survival and neurological outcomes in both pre- and in-hospital settings. Age-appropriate ventilation rates are suggested after advanced airway placement in paediatric cardiac arrest (instead of 10–12 ventilations per minute for all ages previously).(13)

Neonates

The current guideline focuses on making neonatal resuscitation safer and more effective. The resuscitation algorithm remains unchanged. A combination of measures may be required to welcome the newborn to a thermoneutral environment. The critical step of lung aeration should be initiated within the golden minute. Caution is raised against practices such as cord milking among extreme preterms, routine oropharyngeal suctioning, routine tracheal toileting in a setting of meconium-stained amniotic fluid, sustained lung inflation and unregulated use of oxygen. Continuous heart rate monitoring using electrocardiography and oxygen therapy guided by pulse oximetry are desirable. Therapeutic hypothermia should be offered to newborns with moderate to severe perinatal asphyxia.(14)

In conclusion, we would like to thank our dedicated SRFAC members for their hard work in formulating, reviewing and updating our local resuscitation and first aid guidelines for 2021.

References

1. Sands RP, JrBacon DR.An inventive mind:the career of James O. Elam, M.D. (1918–1995). Anesthesiology. 1998;88:1107-12.
2. Safar P.Ventilatory efficacy of mouth-to-mouth artificial respiration;airway obstruction dang manual and mouth-to-mouth artificial respiration. J Am Med Assoc. 1958;167:335-41.
3. Kouwenhoven WB, Jude JR, Knickerbocker GG.Closed-chest cardiac massage. JAMA. 1960;173:1064-7.
4. Diack AW, Welborn WS, Rullman RG, Walter CW, Wayne MA.An automatic cardiac resuscitator for emergency treatment of cardiac arrest. Med Instrum. 1979;13:78-83.
5. Nolan JP, Maconochie I, Soar J, et al. Executive summary 2020 international consensus on cardiopulmonary resuscitation and emergency cardiovascular care science with treatment recommendations. Resuscitation. 2020;156:A1-A22.

6. Ho AFW, De Souza NNA, Blewer AL, et al. Singapore Pan-Asian Resuscitation Outcomes Study (PAROS) investigatorsImplementation of a national 5-year plan for prehospital emergency care in Singapore and impact on out-of-hospital cardiac arrest outcomes from 2011 to 2016. J Am Heart Assoc. 2020;9:e015368.
7. Anantharaman V.Resuscitation medicine:a dose or two for everyone. Singapore Med J. 2017;58:345-6.
8. Lim SH, Chee TS, Wee FC, et al. Singapore Basic Cardiac Life Support and Automated External Defibrillation Guidelines 2021. Singapore Med J. 2021;62:415-23.
9. Zarisfi F, Pek JH, Oh JHH, Loke JH, Lim SH.Singapore First Aid Guidelines 2021. Singapore Med J. 2021;62:427-32.
10. Ching CK, Leong BSH, Nair P, et al. Singapore Advanced Cardiac Life Support Guidelines 2021. Singapore Med J. 2021;62:390-403.
11. Chia YW, Lim SL, Loh JK, Leong BSH, Ong MEH.Singapore National Targeted Temperature Management WorkgroupBeyond return of spontaneous circulation:update on post-cardiac arrest management in the intensive care unit. Singapore Med J. 2021;62:444-51.
12. Lim JH, Chakaramakkil MJ, Tan BKK.Extracorporeal life support in adult patients with out-of-hospital cardiac arrest. Singapore Med J. 2021;62:433-7.
13. Ong GYK, Ngiam N, Tham LP, et al. Paediatric Subcommittee 2016–2021, Singapore Resuscitation and First Aid CouncilSingapore Paediatric Resuscitation Guidelines 2021. Singapore Med J. 2021;62:372-89.
14. Biswas A, Ho SKY, Yip WY, et al. Singapore Neonatal Resuscitation Guidelines 2021. Singapore Med J. 2021;62:404-14.

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