

Advancing Pre-Hospital Emergency Care in Singapore



The Singapore Civil Defence Force (SCDF) Emergency Medical Service (EMS) provides 24/7 island-wide coverage for all medical emergencies and each SCDF emergency ambulance is staffed by a paramedic, a firefighter emergency medical technician (EMT) and a full-time national service EMT. Since 2012, we have transformed the structure of the SCDF EMS and have been collaborating closely with the Ministry of Health (MOH) to enhance our EMS capabilities and capacity. We have also continually improved the integration of our emergency care with restructured hospitals' emergency departments. Both the Ministry of Home Affairs and MOH are currently working closely to enhance the preparedness of citizens to swiftly respond to emergencies, as part of SCDF's strategy to build "A Nation of Lifesavers" by year 2025.

In Singapore, there is a relentless increase in demand for healthcare, including pre-hospital emergency care. Since 1997, ambulance calls received by the SCDF have increased

at an average rate of 5% annually. This is largely due to the increasing population, ageing demographics and rise in chronic illnesses over the last decade.

Over the last four years, we have increased our ambulance fleet, enhanced our capabilities with mechanical cardiopulmonary resuscitation (CPR), conducted cross training of firefighters as medical first responders on motorcycles with automated external defibrillators (AEDs), and deployed stronger pain relief drugs like inhaled Pentrox¹ and intramuscular tramadol injections. Hence, don't be surprised if you see a firefighter arriving on scene when you call 995 for a medical emergency!

ONLY A STRONG COMMUNITY SURVIVES CARDIAC ARREST

Annually, there are over 2,300 cardiac arrest cases locally with 70% of them occurring in residential areas. Although our cardiac arrest survival rate has improved from 1% in 2001

to 3% in 2012, this is still relatively low in comparison to many developed countries.

Physicians in the community can play a key role in changing that. When they encounter patients with high risk, physicians can start by educating the caregivers to take CPR/AED training – so they can recognise the emergency, call 995 immediately and start chest compressions.

Since August 2015, the SCDF has piloted the installation of AEDs at the lift lobbies of Housing & Development Board (HDB) estates in six constituencies. This is to enable the community first responders' easy access to AEDs for swift CPR/AED intervention, so as to improve the out-of-hospital cardiac arrest survival rates. Besides the HDB estates, AEDs are also found in many commercial buildings, schools, transport hubs, sports facilities and government buildings today.

However, having publicly accessible AEDs alone is pointless in addressing our low cardiac arrest survival rate if members of the community do not use them. Although AEDs come with built-in step-by-step audio guide that are so easy to follow that even untrained persons can and are encouraged to utilise them, the reality is that very few do. And those who are trained may not always be available. To address this problem, SCDF has partnered with MOH, the People's Association and the Singapore Heart Foundation to conduct a succinct 40-minute CPR-AED awareness programme in the community and schools.



In 2015, SCDF launched the myResponder mobile application to crowdsource CPR/AED-trained persons to attend to potential cardiac arrest cases nearby. There are now over 8,000 registered responders and over 1,000 responses since 2015. These community responders receive alerts on their smartphone if they are within 400 metres of a potential cardiac arrest case reported to the SCDF 995 emergency call centre. The response by notified responders is absolutely *voluntary*. The app also displays the location of nearby AEDs so that responders can bring it along. The app is available on iOS and Android platforms; anyone can download it but to register as a responder, you must be above 15 years old and a SingPass account is required. By doing this, you immediately become a virtual volunteer, making your neighbourhood a safer environment!

EMERGENCY MEDICAL SERVICES OPERATIONS

Although most restructured hospitals have similar standards, certain services such as paediatrics, obstetrics, burns, trauma and interventional cardiology are not available in all hospitals round-the-clock. Thus, SCDF conveys each patient to the nearest and most *appropriate* hospital. In addition, SCDF also conveys lower acuity emergency patients to Raffles Hospital as part of a MOH public-private partnership. If you call 995 on behalf of a patient, it is useful to know that the SCDF may convey the patient to a further hospital for specific conditions after assessment, depending on the patient's condition.

WE DON'T MEAN TO DISRESPECT YOU

Paramedics are trained to deliver care in a very specific way guided by carefully considered protocols that are approved by a committee of senior medical specialists appointed by the Ministry of Home Affairs. Paramedics have to deliver patients' care in accordance to these protocols and are audited regularly for their

compliance to the care pathways. Over the years, I've received comments and sometimes complaints from family physician colleagues that our paramedics "refused to accept" their diagnosis or "disrespected their clinical acumen" by repeating a head-to-toe examination, which in their view wasted a significant amount of time. While it does take time, the paramedics have an operational obligation to perform their initial patient assessment based on the established protocols. By adhering to such protocols, they systematically screen for conditions that may be amendable to immediate intervention. An example of this is hypoglycaemia, which may be initially missed out even by medical professionals.

WE ARE NOT WASTING THE PATIENT'S TIME

On various occasions, I've also received feedback from physicians that our paramedics have delayed the conveyance of the patient by insisting on repeating an ECG at their clinic when the earlier ECG that the physicians performed clearly showed an ST-segment elevation myocardial infarction. The reason that our paramedics repeat the ECG at the clinic is not because we are rigid and inflexible, but that our defibrillators can remotely transmit recorded ECGs directly to the A&E department! The duty emergency physician then activates the cardiac catheterisation laboratory to prepare for a primary percutaneous coronary intervention upon arrival of the patient. Time is myocardium – spending the three minutes to perform and transmit an ECG on scene shortens the door-to-balloon by over 20 minutes.

The result? Better survival outcomes!

WE ARE ONE HEALTHCARE SYSTEM

SCDF continues to innovate in pre-hospital emergency care – we plan to move towards seamless data sharing with the hospitals by 2020. The goal is to retrieve patients' records from the National Electronic Health Record

on scene, use it to provide better care and seamlessly transfer data back to the receiving hospital before arrival. In addition, the sharing of operational data will enable better load balancing of emergency patients with specific requirements such as surgery or intensive care unit, or safely cope with sudden surges in emergency care demand. We hope to realise the Smart Health initiative as part of Singapore's Smart Nation initiative, to create a truly seamless national healthcare network for better patient care. ♦

Note

1. Pentrox is a novel inhaled patient-controlled analgesia approved by Health Sciences Authority; proven by SCDF research to be effective in musculoskeletal trauma in pre-hospital emergency care.

PROFILE



TEXT BY

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COL (Dr) Ng Yih Yng has been the Chief Medical Officer of the Singapore Civil Defence Force since 2012. He is trained in emergency medicine, public health and business administration. This potpourri of skills is what he uses to design innovative public health interventions for emergency medical services in Singapore.

Legend

1. SCDF ambulance crew extricating a trauma patient