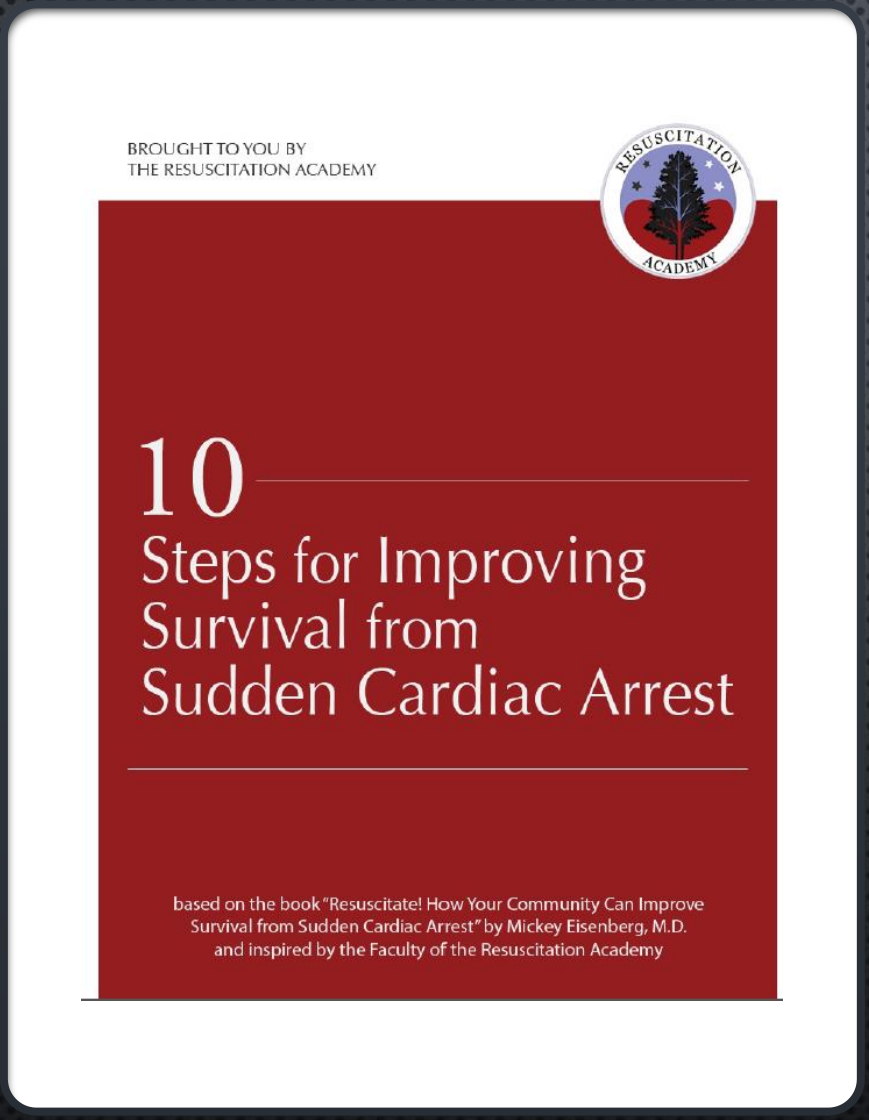


10 STEPS TO IMPROVE CARDIAC ARREST SURVIVAL IN SINGAPORE

ALEXANDER WHITE

UNIT FOR PREHOSPITAL EMERGENCY CARE

FOR

NATIONAL LIFESAVING DAY

SINGAPORE

2020

OPINIONS EXPRESSED HEREIN ARE MY OWN AND SHOULD NOT BE ATTRIBUTED TO ANY ORGANIZATION OR ENTITY.

UNIT FOR PRE-HOSPITAL EMERGENCY CARE
UPEC
SINGAPORE

The 10-steps

Distributed across 3 categories:

- Low hanging fruit
- High hanging fruit
- The reach or higher hanging fruit

STEPS 1-4: THE LOW HANGING FRUIT

1. Establish a Cardiac Registry ☑
2. Implement Dispatcher-Assisted CPR ☑
3. Implement High Performance CPR ☑
4. Implement Rapid Dispatch ☑

10
Steps for Improving Survival from Sudden Cardiac Arrest

1. Establish a Cardiac Registry ☑

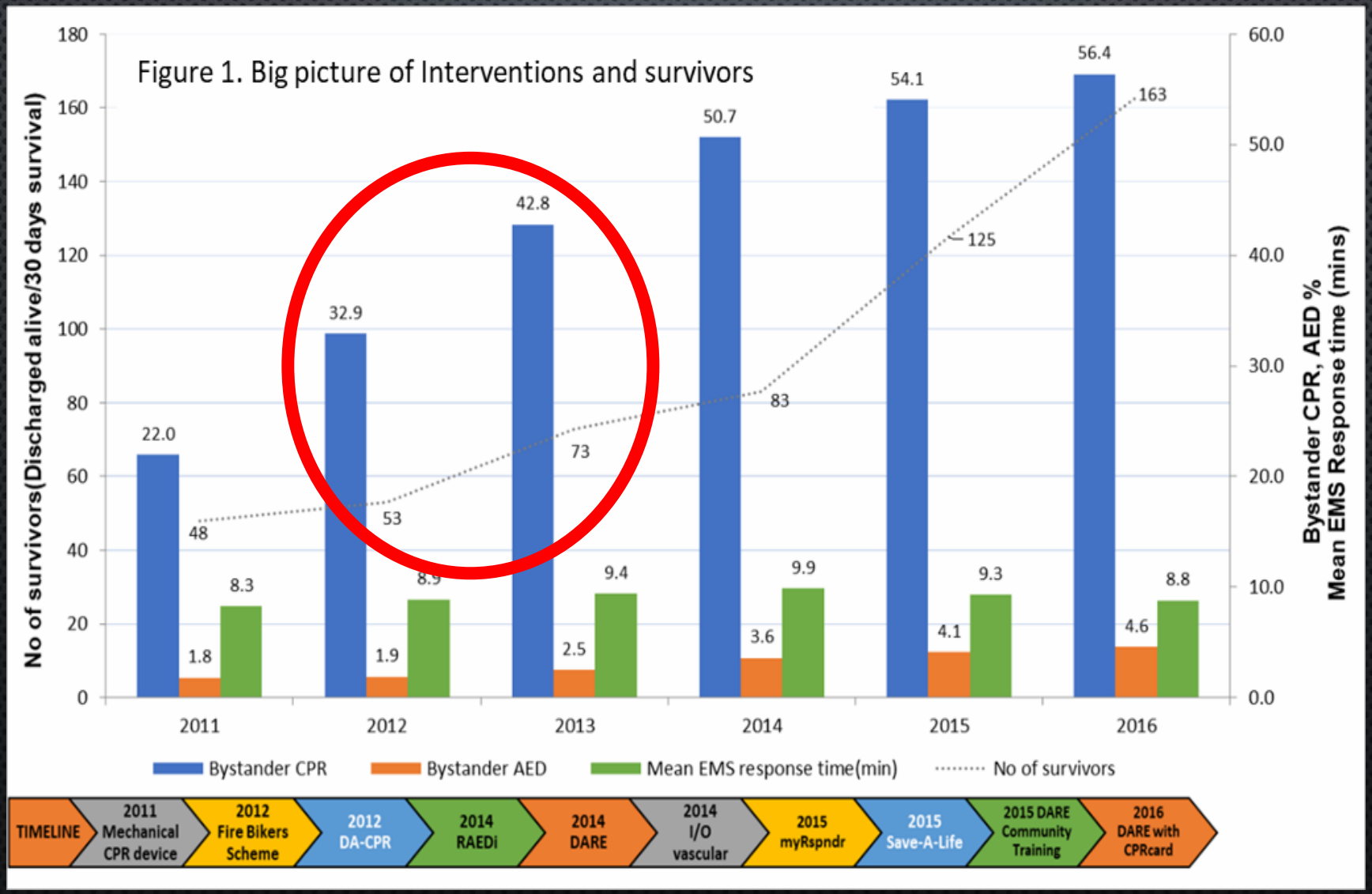
- SG is part of the Pan-Asian Resuscitation Outcomes Study ("PAROS") which includes data from 14 countries and contains over 200,000 cases in it.

- Generally, researchers, policymakers, and other decisionmakers use Registry data to inform policy and interventions.

2. Implement Dispatcher Assisted CPR ☑

- SG implemented DA-CPR in 2012
- Our bystander CPR rate climbed
- And …

SO DID OUR SURVIVAL RATE….



3. Implement High Performance CPR ☑

- In 2019, SG implemented HP-CPR with our SCDF paramedics as part of the PAROS-III study
- Basically HP-CPR works like a F1 pit crew during resuscitation…they work in a highly coordinated fashion
- reduces hands-off time

4. IMPLEMENT RAPID DISPATCH ☑

- "2 NO'S AND A GO" – TO SPEED DETECTION. SCDF CALL TAKERS ASK 2 QUESTIONS:
  1. "IS THE PATIENT CONSCIOUS?" ➡ "NO", IF NOT
  2. "IS HE BREATHING NORMALLY?" ➡ "NO"

- "GO" - SCDF WILL DISPATCH WITH THE HIGHEST PRIORITY LEVEL AND DEPLOY FIRE-BIKER, RED-RHINO, AND AMBULANCE.

STEPS 5-10: THE HIGH HANGING FRUIT

5. Voice Record All Attempted Resuscitations ☑

6. Begin AED Program for 1st responders, e.g., Police, guards, others security ppl. ☑

7. Establish a Public Access Defibrillation Program ☑

10
Steps for Improving Survival from Sudden Cardiac Arrest

5. VOICE RECORD ALL ATTEMPTED RESUSCITATIONS ☑

- SCDF DISPATCH RECORDS ALL 995 CALLS
- OUR NURSE DISPATCHERS WHO HANDLE RESUSCITATION (DA-CPR) CASES SIT WITH THE CLINICAL DIRECTOR AND REVIEW WHAT OCCURRED FOR QI PURPOSES

6. AED PROGRAM FOR 1ST RESPONDERS ☑

- MOST BUILDING SECURITY STAFF HAVE BEEN TRAINED IF THERE IS AN AED ON SITE.
- WE DON'T HAVE A POLICE AED PROGRAMME YET.
- SGSECURE INITIATIVE HAS A CPR+AED SKILLS COMPONENT FOR COMMUNITY RESPONSE PREPAREDNESS.

7. ESTABLISH A PUBLIC AED PROGRAM ☑

- IN 2015, SCDF BEGAN INSTALLING AEDS IN HDB FLATS AND NOW THERE ARE OVER 9000 IN SINGAPORE
- OVER HALF OF THESE AEDS WERE INSTALLED UNDER SCDF'S SAVE-A-LIFE INITIATIVE
- WITH HELP OF SHF, THESE AND OTHER AEDS ARE LOGGED INTO AN AED REGISTRY AND INCLUDED IN THE MYRESPONDER APP FOR AED LOCATING PURPOSES.

STEPS 5-10: THE REACH FOR THE HIGHER HANGING FRUIT

10
Steps for Improving Survival from Sudden Cardiac Arrest

8. Supplemental Funding & Support For Training & QI ☑

9. Institute Hypothermia In All Receiving Hospitals ☑

10. Work Towards A Culture Of Excellence ☑

8. Supplemental Funding & Support for Training & Quality Improvement ☑

- In SG, there are various sources of funding and support
- MOH established and supports UPEC who in turn supports work with PRM, Communities and Hospitals, etc.
  - e.g., Medical Director workshops, DARE CPR+AED, research
- SCDF operations includes training and QI for their EMS staff (e.g., QI for 995 call takers)

9. INSTITUTE HYPOTHERMIA IN ALL RECEIVING HOSPITALS ☑

- COOLING THE BODY (32-36°C) AFTER CARDIAC ARREST RESUSCITATION HELPS PRESERVE THE HEALTH OF VITAL ORGANS DURING THE RECOVERY PERIOD.
- THIS PROCESS IS CALLED TARGET TEMPERATURE MANAGEMENT OR "TTM"
- PUBLIC HOSPITALS IN SG USE TTM

Singapore-developed cooling suit lowers body temperature in half the time: Study

A study by researchers from Singapore General Hospital, National University of Singapore and National Heart Centre Singapore found that the CarbonCool suit can cool a patient's body to 34 deg C in an average of 73 minutes, almost half the time of other methods. ST PHOTO: MARK CHEONG

Rei Kurohi

A wearable cooling device that can help protect a patient's brain and other vital organs following a cardiac arrest has been developed by doctors from Singapore General Hospital (SGH) and an industry partner, Global Healthcare SG.

The CarbonCool suit, as it is called, consists of a wearable suit made of neoprene and thermoplastic polyurethane. It holds 20 cooling pads filled with a graphite water solution that is about 15 times more thermally conductive than ice.

At a press briefing yesterday, Professor Marcus Ong, a senior consultant and clinician scientist at SGH's Department of Emergency Medicine, said: "When a person's heart stops beating, there is no blood flow or oxygen supply to vital organs like the brain, liver and kidneys for a prolonged period of time.

"Research has shown that cooling the body to about 34 degrees is one of the best ways to preserve brain function after cardiac arrest."

The process, called targeted temperature management (TTM), would be initiated after a patient's heart has been restarted, for instance, by paramedics called to an emergency.

Prof Ong said that the faster the body can be cooled to the target temperature, the more likely it is that the patient will regain good brain function, or, in other words, be able to walk, talk and return to work after recovery.

A study by researchers from SGH, National University of Singapore and National Heart Centre Singapore found that the CarbonCool suit can cool a patient's body to 34 deg C in an average of 73 minutes, said SGH senior clinical research coordinator Nur Shahidah Ahmad, the study's main author.

Other methods, such as administering cold water, ice packs and chilled intravenous saline, took an average of 142 minutes, she said.

Prof Ong, a co-author of the study, said these methods have disadvantages – water and ice packs can be messy, and giving a patient too much intravenous fluid can cause other complications.

The suit can also be disinfected after use and the cooling pads can be removed and refrozen for repeated use, Ms Shahidah said.

She added that it does not have to be removed when a patient undergoes X-ray scans, computed tomography (CT) scans or magnetic resonance imaging (MRI).

The suit has other applications such as treating heat stroke, and firefighters could also potentially use it to keep cool, he added.

The Straits Times understands that some Singapore Armed Forces ambulances currently use the suit to treat soldiers with heat injury.

The team is also looking into using a titanium-based compound for the next version of the suit, Prof Ong said.

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Wearable cooling device helps cardiac arrest victims

nces currently use the suit soldiers with heat injury. study team will present its s at SGH's annual scientific g tomorrow. eam is also looking into us- tanium-based compound for xt version of the suit, Prof id.

h.com.sg

CarbonCool suit helps cool body down quickly to preserve brain function

REI KUROHI

A cooling pad (centre) which is part of the wearable cooling device. TNP PHOTO: MARK CHEONG

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TARGET TEMPERATURE

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10. Work toward a culture of excellence ☑

Culture of excellence is very powerful. Hallmarks include:

- Leadership with Uncompromising vision for quality to be achieved and sustained
- Vigilant and fearless Measuring and monitoring indicators of quality ('measure improve, measure improve")
- Team members with team spirit hold each other ACCOUNTABLE to perform at high standards
- ground staff must be EMPOWERED to flag needed improvements meaningfully

What needs to be done

Preparedness:

- Train more people to recognise cardiac arrest and
- Train more people in CPR+AED skills to ensure adequate knowledge, skills, proficiency, and sustain it
- Innovate approaches to get AEDs on scene faster
- Explore potential benefit of a police AED programme

Emergency Response:

- Quicker activation of emergency system
- Faster recognition of cardiac arrest by dispatchers
- Wider implementation of high-performance CPR

THANK YOU

"TOWARDS A WORLD-CLASS PREHOSPITAL EMERGENCY CARE SYSTEM FOR SINGAPORE"