CASE STUDY · RESUSCITATION ACADEMY

# High-Performance CPR: The Development and Implementation of a Statewide, Multi-agency Model in Victoria, Australia

## BRIEF BACKGROUND

Ambulance Victoria (AV) is a regional leader in out-of-hospital cardiac arrest outcomes, with 37% of patients in the Utstein group surviving hospital discharge in 2017-2018. However, reflection on practice and comparison with local and international EMS agencies identified an opportunity to improve performance during resuscitation attempts. High-performance CPR was highlighted as a key initiative likely to have a significant impact on patient survival in Victoria. AV conducted a CPR Feedback Pads trial in 2017, analyzing the CPR performance at approximately 80 resuscitation attempts. Results showed that optimal compression depth and rate were only achieved 50% of the time, and prolonged pre-shock pauses resulted in almost one third of cases having a chest compression fraction (CCF) <80%. Survey results revealed that 96% of paramedics wanted feedback on CPR quality to help significantly improve performance.

## STEPS TAKEN

After reviewing the current literature, a multi-disciplinary committee was established to examine AV's existing practices and guide the development of a new HP-CPR model for AV and external Emergency Medical Responder (EMR) partners, including the Metropolitan Fire Brigade and Country Fire Authority.

An HP-CPR education program was developed that included a combination of eLearning modules, didactic teaching and simulation-based training which commenced in October 2018. AV worked collaboratively with EMR partners to develop an integration model of HP-CPR. This enables EMR crews to integrate seamlessly into AV's HP-CPR model when co-responding to OHCAs. The impact of HP-CPR was further enhanced through real-time audio-visual feedback and data-driven debriefing.

## CHALLENGES

Establishing productive and collaborative teams within various internal departments and among external EMR agencies posed a significant challenge. To enable successful programs, the teams had to manage expectations and maintain focus on the common goal of improving survival outcomes. Another obstacle was the integration of new technologies and infrastructure required to collect and measure CPR performance data.



*Integration of AV and EMR crews at an OHCA (simulation)*

## RESULTS

As part of the overall implementation of HP-CPR, the following initiatives have been introduced:

### *Operational*

- A renewed focus on high-quality CPR
    - Statewide, multi-agency training in CPR skills and cardiac arrest management
    - Defibrillator audio-visual feedback and peer feedback on CPR utilizing CPR Feedback Pads and metronome
    - Strategic delay to the application of mechanical CPR

- Introduction of a Resuscitation Team Leader and a structured pit crew approach

- Utilization of a checklist during the resuscitation attempt and introduction of a hot debrief

- Introduction of rapid manual ECG rhythm analysis with hands-on charging of the defibrillator

### *Quality improvement and research*

- Collecting CPR performance data through CPR Feedback Pads

- Providing responder education through data-driven, performance focused debriefing

- Collating CPR performance data with records in the cardiac arrest registry, providing invaluable opportunities to explore the relationship between CPR performance and patient outcomes

Early data suggests a significant improvement in CPR performance since the implementation of HP CPR, with optimal chest compression depth achieved 89% of the time, target rate 58% of the time and an average CCF >90%.

## OUTLOOK

Ambulance Victoria anticipates that the real-time audio-visual feedback provided through CPR Feedback Pads during the resuscitation attempt, in combination with ongoing training in HP-CPR and structured debriefing, will result in the delivery of high-quality CPR and improved patient outcomes. The development and implementation of AV's HP-CPR model has strengthened partnerships with EMR agencies, and as co-responder locations expand across Victoria, so will the improvements in patient care in these regions.

## CONTACT

Matt Rose, Ambulance Victoria – Resuscitation Officer: Matthew.Rose@ambulance.vic.gov.au