

## High-quality cardiopulmonary resuscitation based on CQI (Cardiopulmonary Resuscitation Quality Index)

### CQI Cardiopulmonary resuscitation quality index

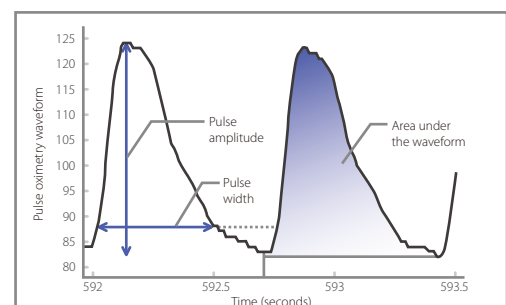
CQI (Cardiopulmonary Resuscitation Quality Index) was jointly researched and developed by Mindray and Peking Union Medical College Hospital for eight years. Based on the non-invasive measurement technology of pulse oximetry ( $SpO_2$ ), it comprehensively reflects the rescuer's compression quality and the patient's perfusion state during cardiopulmonary resuscitation, and provides an objective evaluation index for clinical medical staff to monitor the quality of cardiopulmonary resuscitation and predict the possibility of patient ROSC.



### Monitor the quality of cardiopulmonary resuscitation

Studies have confirmed: the  $SpO_2$  waveform can reflect the volume state, and the area under the pulse oximetry waveform (AUC) can reflect stroke volume<sup>1</sup>. Mindray combines venous blood oxygen compensation technology, spectrum array analysis and fundamental frequency multiplication technology to analyze the  $SpO_2$  waveform, and develops CQI parameters that can reflect the state of blood perfusion.

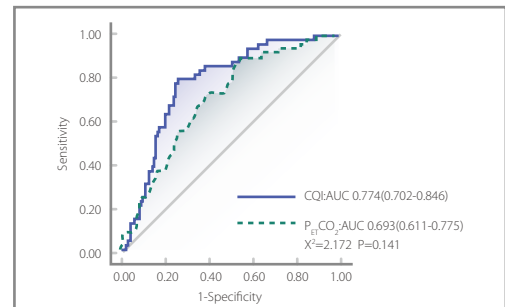
- The value range of CQI parameters is 0-100. When the CQI value is lower than 60, it means that the patient's peripheral circulation is not good, and the quality of cardiopulmonary resuscitation is poor.
- It is necessary to improve compression or take other measures to improve the patient's perfusion; when the CQI value is higher than 60, it means that the patient's peripheral circulatory state is good, and the quality of cardiopulmonary resuscitation is good.



## CQI outperforms $P_{ET}CO_2$ in predicting ROSC

The AHA cardiopulmonary resuscitation guidelines recommend the use of end-tidal partial pressure of carbon dioxide ( $P_{ET}CO_2$ ) to monitor the effectiveness of resuscitative maneuvers and predict the likelihood of ROSC in patients<sup>2</sup>.

- The figure on the right shows the ROC curve (receiver operating characteristic) of CQI (threshold: 60) and  $P_{ET}CO_2$  (threshold: 15mmHg) predicting ROSC
- The area under the curve (AUC) of ROSC predicted by CQI was 0.774, and the 95% CI was 0.702-0.846; the area under the curve of ROSC predicted by  $P_{ET}CO_2$  was 0.693, and the 95% CI was 0.611-0.7753



## Advantages of CQI Monitoring



**Non-invasive:** Based on Mindray pulse oximetry monitoring



**Intuitive:** Quantifies the quality of cardiopulmonary resuscitation in numerical form. The larger the CQI value, the better the patient's perfusion and the higher the quality of cardiopulmonary resuscitation



**Accurate:** Validated by 14 hospitals headed by Peking Union Medical College Hospital, and proved by more than 2000 cases



**Comprehensive:** Supports real-time display of compression frequency to help rescuers achieve high-quality compressions

<sup>1</sup> McGrath S. P, Ryan K. L, Wendelken S. M, et al. Pulse oximeter plethysmographic waveform changes in awake, spontaneously breathing, hypovolemic volunteers [J]. *Anesth Analg*, 2011, 112(2): 368-374.

<sup>2</sup> 2010 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care

<sup>3</sup> CQI medical device clinical trial report